South Westside Basin Groundwater Management Plan

July 2012

South Westside Basin
Groundwater Management Plan

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ACRONYMS AND ABBREVIATIONS

1999 Plan	proposed Westside Basin AB 3030 Groundwater Management Plan
AB	Assembly Bill
Advisory Committee	South Westside Basin GWMP Advisory Committee
AF	acre-feet
AFY	acre-feet per year
Basin Plan	San Francisco Bay Basin Water Quality Control Plan
BMO	Basin Management Objective
CalWater	California Water Service Company
cfs	cubic feet per second
DPH	California Department of Public Health
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ft	feet
GAMA	Groundwater Ambient Monitoring Assessment
gpm	gallons per minute
GPS	global positioning satellites
Groundwater Task Force	South Westside Basin Groundwater Task Force
GSR	Regional Groundwater Storage and Recovery Project
GWMP	groundwater management plan
Groundwater Model	Westside Basin Groundwater Flow Model
ILPS	In-Lieu Pilot Study
InSAR	interferometric synthetic aperture radar
IRWMP	Integrated Regional Water Management Plan
JPA	joint powers agreement
MCL	maximum contaminant level

mgd	million gallons per day
μg/L	micrograms per liter
mg/L	milligrams per liter
MOU	Memorandum of Understanding
N	nitrogen
NAWQA	National Ambient Water Quality Assessment
NCCWD	North Coast County Water District
NPDES	National Pollutant Discharge Elimination System
NSMCSD	North San Mateo County Sanitation District
PCE	Tetrachloroethylene
Plan Area	area covered by South Westside Basin Groundwater Management Plan
ppm	parts per million
psi	pounds per square inch
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SB	Senate Bill
SFIA	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SMCL	secondary maximum contaminant level
SVOCs	semi-volatile organic compounds
TCE	Trichloroethylene
TDS	total dissolved solids
USGS	United States Geological Survey
USDA-NRCS	United States Department of Agriculture Natural Resources Conservation Service
Water Board	California State Water Resources Control Board
Westside Basin	Westside Groundwater Subbasin
Wholesale Water Supply Agreement	Water Supply Agreement between The City And County of San Francisco And Wholesale Customers in Alameda County, San Mateo County, And Santa Clara County

1 INTRODUCTION AND BACKGROUND

1.1 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

The purpose of the South Westside Basin Groundwater Management Plan (GWMP), including development of the plan and the plan document itself, is to provide a framework for regional groundwater management in the South Westside Basin that sustains the beneficial use of the groundwater resource. This includes:

- Informing the public of the importance of groundwater and of the challenges and opportunities presented by groundwater supplies;
- Developing consensus among stakeholders on issues and solutions related to groundwater;
- Building relationships among stakeholders within the basin and between state and federal agencies; and
- Defining actions to ensure the long-term sustainability of groundwater resources in the South Westside Basin.

This GWMP provides recommendations that, when implemented, are intended to maintain or enhance long-term groundwater levels and quality and minimize land subsidence.

The goal of the GWMP is to ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management.

1.2 DESCRIPTION OF THE GROUNDWATER BASIN AND PLAN AREA

The South Westside Basin GWMP area (Plan Area) is the portion of the Westside Groundwater Subbasin (Westside Basin), Basin 2-35, as defined by the California Department of Water Resources (DWR), within the boundaries of San Mateo County. The Plan Area is shown in Figure 1.1. Areas within the northern portion of the DWR-defined Westside Basin, in the City and County of San Francisco, are described in the draft *North Westside Basin Groundwater Basin Management Plan* (SFPUC, 2005).

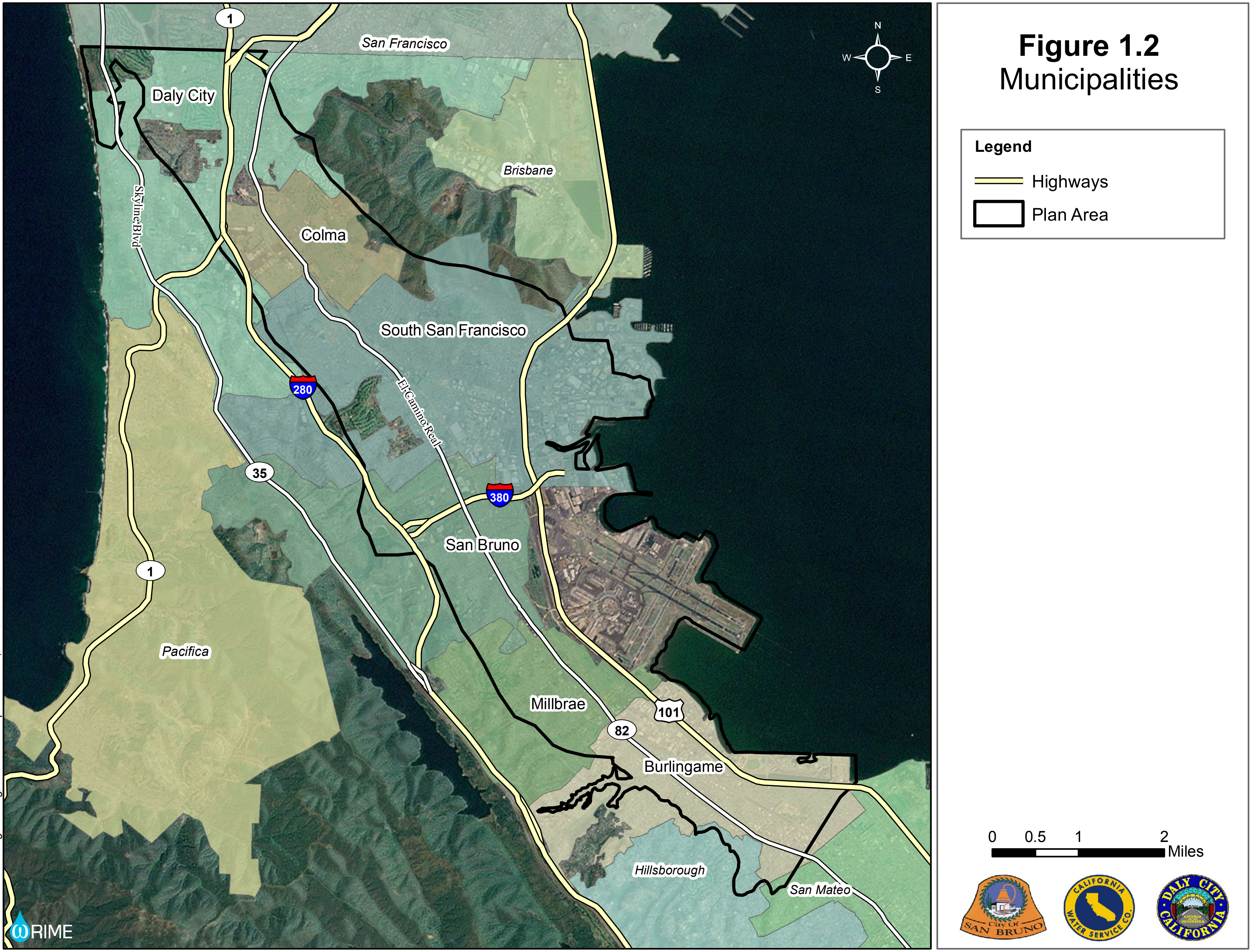
Overlying municipalities, shown in Figure 1.2, include Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame. Water agencies serving the Plan Area are shown in Figure 1.3 and include Daly City, California Water Service Company (CalWater) – South San Francisco District, San Bruno, Millbrae, and Burlingame. Additionally, the San Francisco Public Utilities Commission (SFPUC) provides retail water service to the Golden Gate National Cemetery in San Bruno and wholesale water to the retail agencies.

Figure 1.1
Plan Area

Source: Groundwater Basin: DWR, 2003

F:\215 - San Bruno\Figures\Figure 1.1 Plan Area.mxd, March 21, 2011

Figure 1.2
Municipalities



F:\215 - San Bruno\Figures\Figure 1.2 Municipalities.mxd, March 21 2011

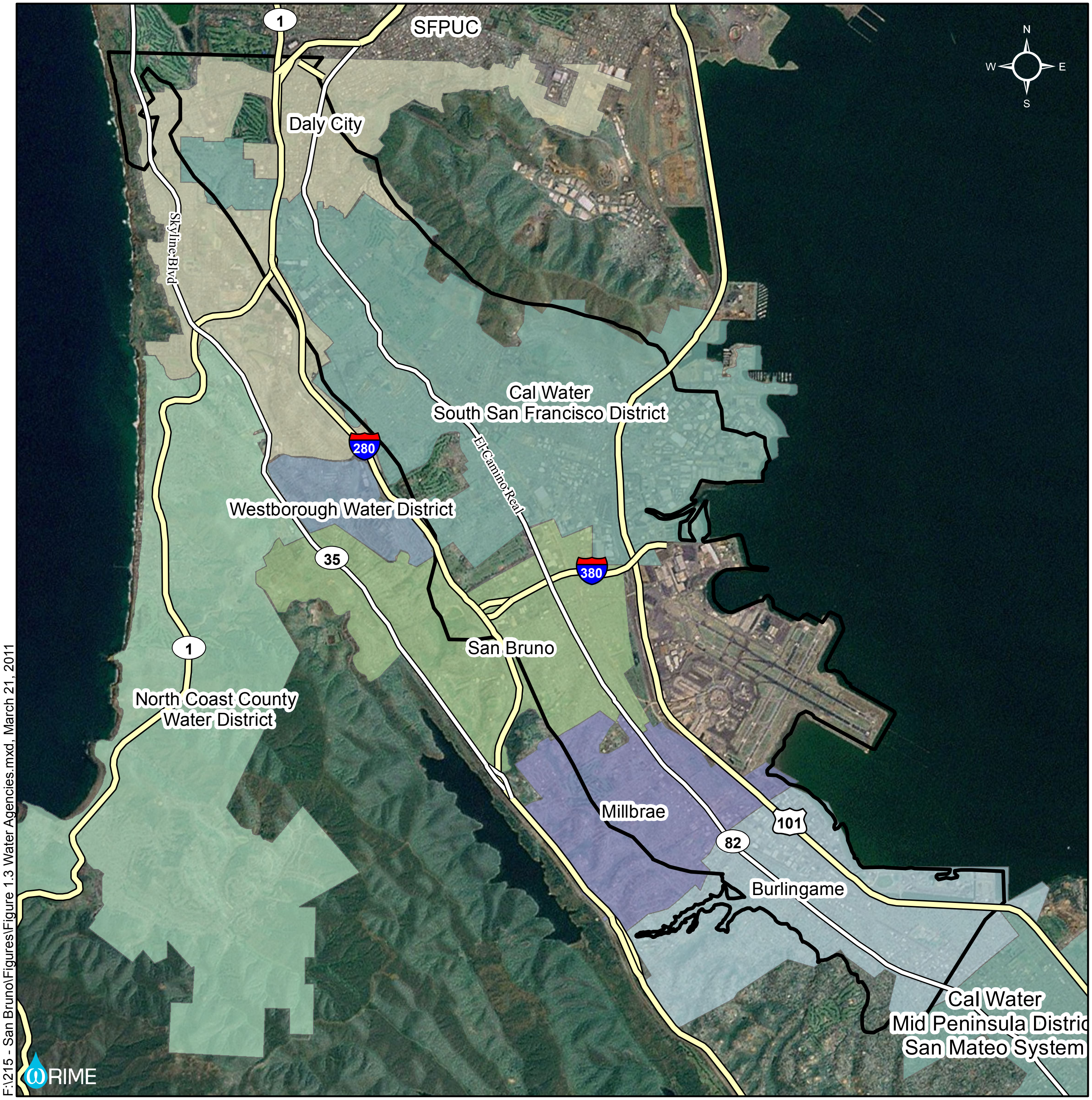


Figure 1.3
Water Agencies

Legend

Highways

Plan Area

F:\215 - San Bruno\Figures\Figure 1.3 Water Agencies.mxd, March 21, 2011

1.3 OVERVIEW OF WATER REQUIREMENTS AND SUPPLIES

Located on the San Francisco Peninsula, the South Westside Basin underlies approximately 25 square miles and provides groundwater to Colma, Daly City, San Bruno, South San Francisco, unincorporated areas, cemeteries, golf courses, and several smaller users.

The Plan Area is considered built-out, with very little undeveloped land available for development. Future growth will occur through infill, including increased density on existing developed parcels. Land use in the basin is approximately 80 percent urban; 15 percent irrigated parks, golf courses, and cemeteries; and 5 percent unirrigated open space, as shown in Figures 1.4a and 1.4b. Urban areas include large portions of the cities of Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame, as well as urbanized unincorporated areas. The total 2010 water demand for the area was approximately 29,000 acre-feet (AF) (Bay Area Water Supply & Conservation Agency [BAWSCA] 2011; SFPUC, 2011).

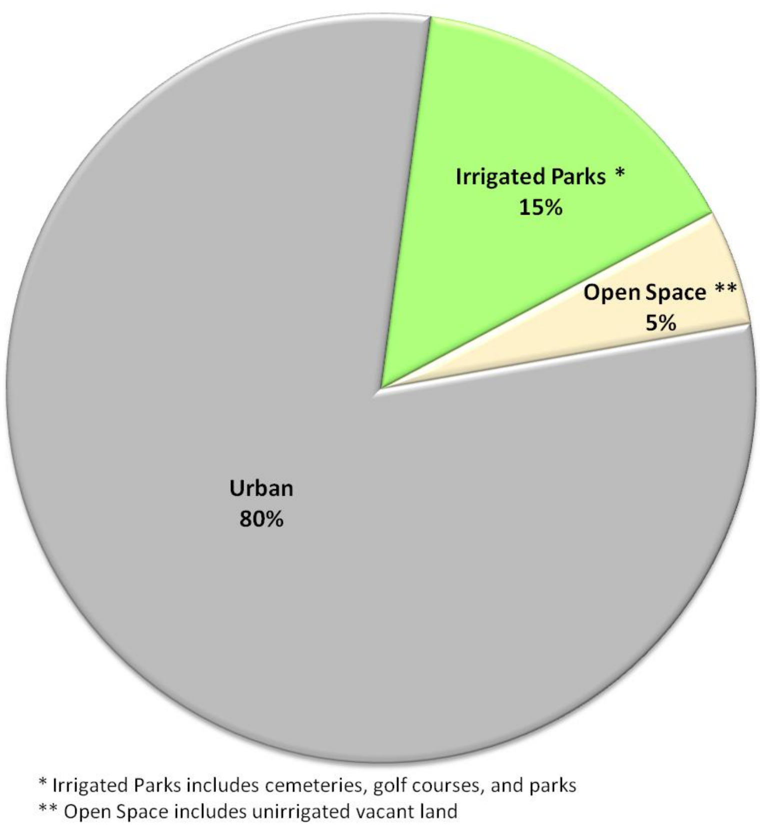
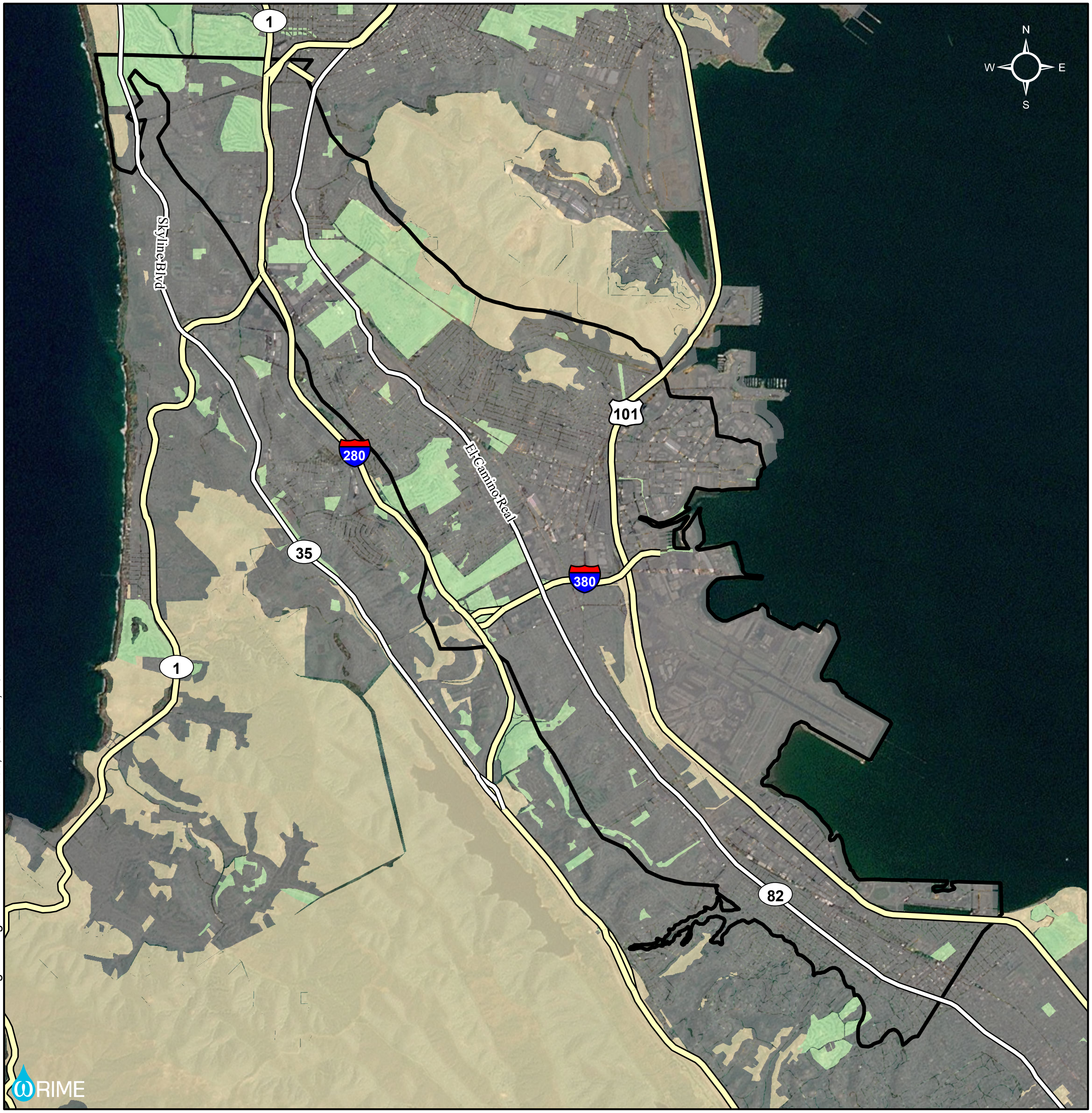


Figure1.4a Current Land Use Summary

Figure 1.4b
Current Land Use



Legend

Highways

Plan Area

Planned Land Use

Urban

Parks, Cemeteries, Golf Courses

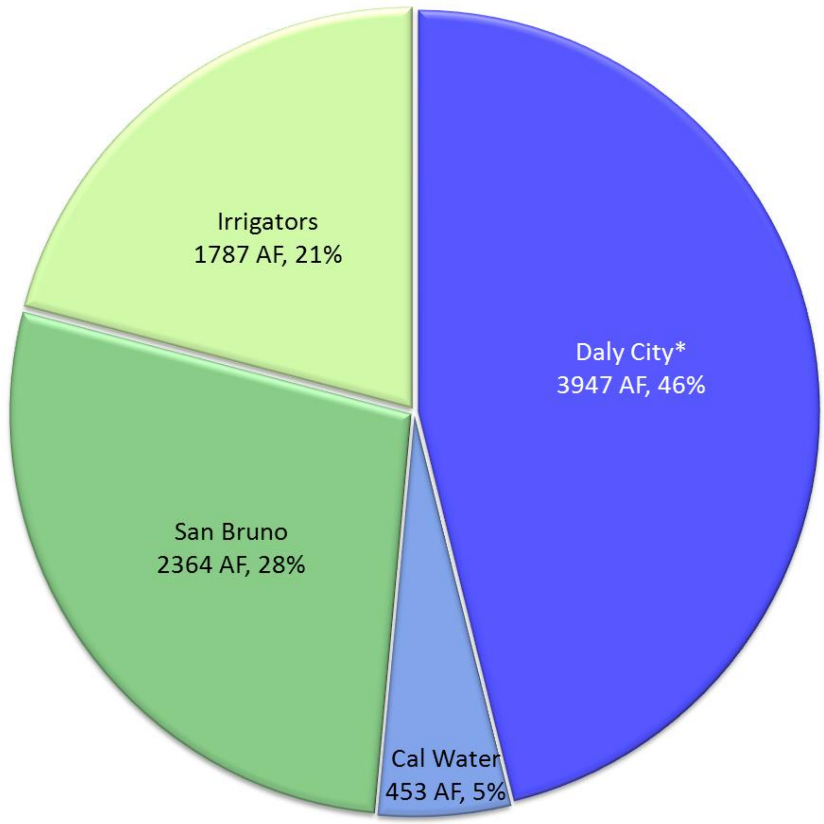
Open or Vacant Land

0 0.5 1 2
Miles

Source: Land Use - Based on ABAG, 2006

F:\215 - San Bruno\Figures\Figure 1.4b Current Land Use, March 21, 2011

In the South Westside Basin, groundwater plays a critical role, providing up to 50 percent of some localities' water supplies, making it an important resource for the future prosperity and sustainability of the region. Approximately 8,600 AF of groundwater was produced from the South Westside Basin in 2010 (SFPUC, 2011) including 2,200 AF of groundwater banked through in-lieu recharge under the In-Lieu Pilot Study (see Section 1.5.3). Figure 1.5 shows the breakdown of groundwater production by producer for 2010. Imported water from SFPUC's Hetch Hetchy system, along with small quantities of recycled water, provides the remaining supply.



*** Value includes 2,204 AF of banked in-lieu recharge water**

Figure 1.5 Groundwater Production by Entity, 2010

While the Plan Area and surrounding region are largely built-out, additional growth through infill is expected, along with associated increases in water demands. As demands for imported water supplies continue to rise, groundwater will continue to play a key role in delivering a cost-effective and reliable water supply to the South Westside Basin.

1.4 LEGISLATION RELATED TO GROUNDWATER MANAGEMENT PLANS

Groundwater is a resource shared by numerous users; it does not recognize or adhere to jurisdictional lines and cannot be tagged for use by certain users. Groundwater rights have evolved through case law since the late 1800s. Currently, three basic methods are available for managing groundwater resources in California:

- Local agency management under authority granted by the California Water Code or other applicable state statutes (such as through a GWMP);
- Local government groundwater ordinances or joint powers agreements (JPA); and
- Court adjudications.

No law requires that any of these forms be applied within a basin. As such, management is often instituted after local agencies or landowners recognize specific issues in groundwater conditions. The level of groundwater management in any basin or subbasin is often dependent on water availability and demand, as well as groundwater quality.

In an effort to standardize groundwater management, the California Legislature passed Assembly Bill (AB) 255 (Stats. 1991, Ch. 903) in 1991. This legislation authorized local agencies overlying basins subject to critical overdraft conditions, as defined in DWR's Bulletin 118-80 (DWR, 1980), to establish programs for groundwater management within their service areas. Water Code § 10750 et seq. provided these agencies with the powers of a water replenishment district to raise revenue for facilities to manage the basin for the purposes of extraction, recharge, conveyance, and water quality management. Seven local agencies adopted plans under this authority. The South Westside Basin has never been defined by DWR as being critically overdrafted, as such it was not subject to AB 255.

The provisions of AB 255 were repealed in 1992 with the passage of AB 3030 (Stats. 1992, Ch. 947). This legislation greatly increased the number of local agencies authorized to develop a GWMP and set forth a common management framework for local agencies throughout California. AB 3030, codified in Water Code § 10750 et seq., provides a systematic procedure to develop a groundwater management plan by local agencies overlying the groundwater basins defined by DWR's Bulletin 118 (DWR, 1975) and updates (DWR, 1980, 2003). Upon adoption of a plan, these agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (Water Code, § 10754). However, the authority to fix and collect these fees and assessments is contingent on receiving a majority of votes in favor of the proposal in a local election (Water Code, § 10754.3).

By 2003, more than 200 agencies (shown in Figure 1.6) had adopted an AB 3030 GWMP (DWR, 2003). None of these agencies is known to have exercised the authority of a water replenishment district.

Water Code § 10755.2 expands groundwater management opportunities by encouraging coordinated plans and authorizing public agencies to enter into a JPA or memorandum of understanding (MOU) with public or private entities providing water service. At least 20 coordinated plans have been prepared to date involving nearly 120 agencies, including cities and private water companies.

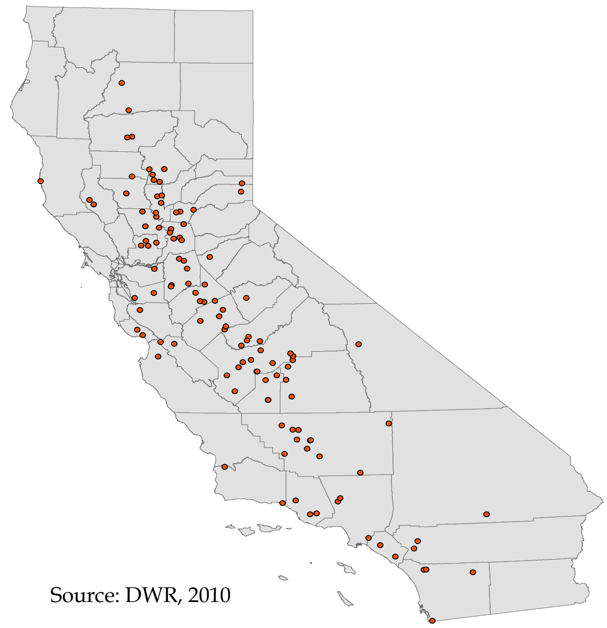


Figure 1.6. Location of areas with groundwater management plans

In 2002, the California Legislature passed Senate Bill (SB) 1938 (Stats. 2002, ch. 603), which provides local agencies with incentives for improved groundwater management. While not providing a new vehicle for groundwater management, SB 1938 modified the Water Code by requiring specific elements be included in a GWMP for an agency to be eligible for certain funding administered by DWR for groundwater projects.

Through AB 3030 and SB 1938, local agencies can now develop GWMPs that guide the sustainable use of the groundwater resource while also providing access to certain DWR funding sources.

1.5 PRIOR AND CURRENT WATER MANAGEMENT PLANNING EFFORTS

The South Westside Basin has an extensive history of management of groundwater and surface water resources. This document builds upon those efforts, described below.

1.5.1 DRAFT WESTSIDE BASIN GROUNDWATER MANAGEMENT PLAN

In 1999, cities and water purveyors overlying much of the Westside Basin (Daly City, CalWater, San Bruno, and SFPUC) cooperatively developed a proposed Westside Basin AB 3030 Groundwater Management Plan (1999 Plan; Bookman-Edmonston, 1999), pursuant to the guidelines in AB 3030. Although not adopted by the cities due to data gaps and other concerns at the time, the four cities and water purveyors have voluntarily implemented much of the recommendations and other aspects of the 1999 Plan.

The 1999 Plan established a goal of protecting water quality and enhancing water supply reliability in the Westside Basin. This goal was supported by five plan elements:

- **Groundwater Storage and Quality Monitoring –** development of a basin-wide monitoring program
- **Saline Water Intrusion –** use of monitoring data to indicate any occurrence of saltwater intrusion and to provide technical information needed to develop appropriate management responses if intrusion occurs
- **Conjunctive Use –** development of a multi-agency conjunctive use program, including monitoring
- **Recycled Water –** development of a recycled water program for landscape irrigation and other non-potable uses
- **Source Water and Wellhead Protection –** protection of groundwater from contamination from methyl tert-butyl ether (MTBE) and other contaminants through source water assessment methodologies

1.5.2 Regional Groundwater Storage and Recovery Project

The proposed Regional Groundwater Storage and Recovery (GSR) Project is designed to balance the use of both groundwater and surface water to increase water supply reliability during dry years or in emergencies. Located in the South Westside Basin, the proposed project is sponsored by SFPUC in coordination with partner agencies: CalWater, Daly City, and San Bruno. The partner agencies currently purchase wholesale surface water from SFPUC and also independently operate groundwater production wells for drinking water and irrigation.

The project would consist of installing up to 16 new recovery well facilities in the South Westside Basin to pump stored groundwater during a drought. During years of normal or above normal precipitation, the proposed project would provide surface water to the partner agencies to reduce the amount of groundwater pumped. The reduced pumping is estimated to result in the storage of approximately 61,000 AF of water in the long-term. This is estimated to allow recovery of stored water at a rate of up to 7.2 million gallons per day (mgd) for a 7.5-year drought period, if the full 61,000 AF is stored prior to the drought period (MWH, 2007). The storage of water in the basin was analyzed through the In-Lieu Pilot Study (ILPS), which is described in the following section.

The GSR Project is in the design and environmental review phases and is envisioned to coordinate management of groundwater supplies through an Operating Committee. The development of the GSR Project includes extensive study of the hydrogeology of the South

Westside Basin and was documented in the Alternatives Analysis Report (MWH, 2007) and in reports documenting monitoring well installation (Kennedy/Jenks, 2009 and 2010).

The parties are working to develop an operating agreement in connection with the proposed GSR Project. To-date, the SFPUC has installed ten multi-level monitoring wells in the South Westside Basin (each consisting of 4 nested monitoring wells). The Proposed Project Draft EIR is scheduled to be circulated in 2012.

1.5.3 In-Lieu Pilot Study

Beginning in 2002, SFPUC delivered surface water in-lieu of groundwater through the ILPS to Daly City, San Bruno and CalWater - South San Francisco District. The ILPS demonstrated that SFPUC system water can be stored in the Basin through the delivery of in-lieu water to replace groundwater that Daly City, San Bruno, and CalWater refrained from pumping (Luhdorff & Scalmanini Consulting Engineers [LSCE], 2005).

During the ILPS, significant quantities of water were banked as shown in Figure 1.7 and discussed below:

- **Daly City -** Through May 7, 2007, SFPUC delivered 13,077 AF of in-lieu water to Daly City. Beginning in May 2009, SFPUC resumed delivery of in-lieu water to Daly City, resulting in additional banking of water. In 2009 and 2010, 1,921 AF and 2,204 AF of water was banked by Daly City, respectively.
- **CalWater – South San Francisco District -** Between February 1, 2003 and November 1, 2003, SFPUC delivered 802 AF of in-lieu water to CalWater – South San Francisco District. When the ILPS restarted on April 1, 2004, CalWater did not participate and did not resume pumping, but continued to rely on wholesale water for all of its water needs in its South San Francisco service area. This resulted in an increase in basin water levels as if CalWater had continued to participate in the ILPS, and a corresponding increase in stored water of 930 AF between April 1, 2004 and March 1, 2005.
- **San Bruno –** From January 28, 2003 through March 1, 2005, SFPUC delivered 3,915 AF of in-lieu water to San Bruno.

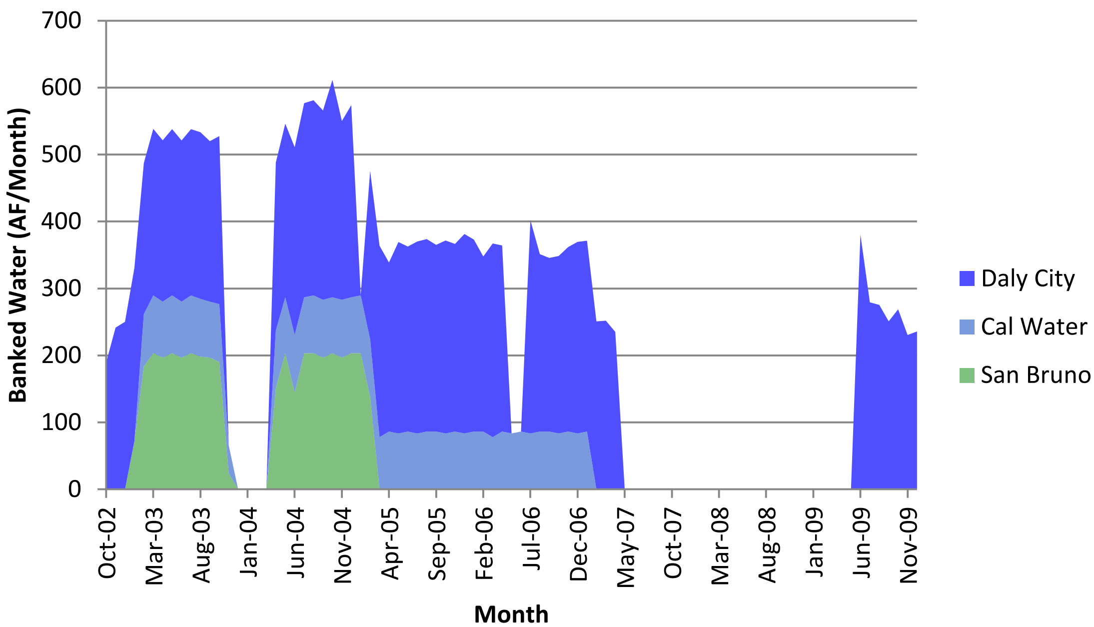


Figure 1.7 Banked Groundwater in In-Lieu Pilot Study

1.5.4 San Francisco Bay Basin Water Quality Control Plan

The *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) (California Regional Water Quality Control Board, San Francisco Bay Region [RWQCB], 2010) was developed by the RWQCB to provide positive and firm direction for future water quality control.

The Basin Plan fulfills the following needs:

- Requirements from the U.S. Environmental Protection Agency (EPA) for such a plan to allocate federal grants to cities and districts for construction of wastewater treatment facilities.
- A basis for establishing priorities for disbursing both state and federal grants for constructing and upgrading wastewater treatment facilities.
- Requirements of the Porter-Cologne Act that call for water quality control plans in California.
- A basis for the RWQCB to establish or revise waste discharge requirements and for the State Water Resources Control Board (Water Board) to establish or revise water rights permits.
- Conditions (discharge prohibitions) that must be met at all times.
- Water quality standards applicable to waters of the Region, as required by the federal Clean Water Act.

- o Water quality attainment strategies, including total maximum daily loads required by the Clean Water Act, for pollutants and water bodies where water quality standards are not currently met.

While the Basin Plan has a definite focus on surface water resources, groundwater quality is included as well, particularly through the watershed management approach. This approach includes groundwater as well as surface water bodies (e.g., streams, rivers, lakes, reservoirs, wetlands, and the surrounding landscape) in an effort to develop unique, integrated solutions for individual watersheds through a stakeholder process.

As with surface water, the Basin Plan establishes beneficial uses for groundwater throughout the San Francisco Bay Region. For the South Westside Basin, the Basin Plan identifies two areas: Westside C (2-35C), extending from the San Francisco County line to the City of South San Francisco, and Westside D (2-35D), extending from South San Francisco to the southern extent of the South Westside Basin. The designated beneficial uses for groundwater within these areas, and within areas in the North Westside Basin, are shown in Table 1.1.

Table 1.1 Basin Plan Beneficial Uses for Groundwater

Basin Plan Basin	Location	Beneficial Uses			
		Municipal and Domestic Water Supply	Industrial Process Water Supply	Industrial Service Water Supply	Agricultural Water Supply
Westside C	South Westside Basin	Existing	Potential	Potential	Existing
Westside D	South Westside Basin	Existing	Existing	Existing	Potential
Westside A	North Westside Basin	Existing	Potential	Potential	Existing
Westside B	North Westside Basin	Potential	Potential	Potential	Existing

The Basin Plan sets objectives for groundwater, with maintenance of existing high-quality of groundwater being the primary objective. In addition, at a minimum, groundwater shall not contain concentrations of bacteria, chemical constituents, radioactivity, or substances producing taste and odor in excess of the objectives unless naturally occurring background concentrations are greater. Under existing law, the Water Board regulates waste discharges to land that could affect water quality, including both groundwater and surface water quality. Waste discharges that reach groundwater are regulated to protect both groundwater and any surface water in continuity with groundwater. Waste discharges that affect groundwater in continuity with surface water cannot cause violations of any applicable surface water standards.

For implementation, the RWQCB focuses on 28 groundwater basins and 7 sub-basins in the Bay Area that serve, or could serve, as sources of high quality drinking water. The Westside Basin is one of these basins. The Basin Plan establishes the following groundwater protection and management goals for the Bay Area region:

- Identify and update beneficial uses and water quality objectives for each groundwater basin.
- Regulate activities that impact or have the potential to impact the beneficial uses of groundwater of the region.
- Prevent future impacts to the groundwater resource through local and regional planning, management, education, and monitoring.

1.5.5 San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project

RWQCB staff, with contributions from local agencies, evaluated existing groundwater protection programs and beneficial uses of groundwater in San Francisco and northern San Mateo County (RWQCB, 1996). Extensive research was conducted and numerous references were compiled to complete the project. The project included the following goals:

- Describe the hydrogeology and groundwater uses for the groundwater basins
- Identify major threats to groundwater and groundwater protection programs
- Identify locations where groundwater is vulnerable to contamination
- Identify locations where groundwater monitoring is needed
- Use GIS to compile complex data sets to use as a decision-making tool for groundwater protection
- Refine beneficial use designations for some groundwater basins
- Identify inactive well locations
- Describe groundwater extraction for municipal, agricultural, and industrial water supply
- Summarize statewide initiatives for groundwater protection and data sharing

- o Evaluate special problem areas not typically addressed by groundwater protection programs

The results of the project identified the Westside Basin as a valuable resource deserving of full protection and restoration, including aggressive remediation of contaminated groundwater, enhanced source control and groundwater protection to prevent additional pollution, and groundwater basin management to prevent overdraft.

1.5.6 GROUNDWATER AMBIENT MONITORING AND ASSESSMENT PROGRAM: SAN FRANCISCO BAY STUDY UNIT

The Groundwater Ambient Monitoring and Assessment (GAMA) program is a comprehensive assessment of statewide groundwater quality implemented by the Water Board in coordination with the U.S. Geological Survey (USGS) and Lawrence Livermore National Laboratory. The program is designed to help better understand and identify risks to groundwater resources. The South Westside Basin was included in the study through the investigation of the San Francisco Bay study unit, which includes portions of San Francisco, San Mateo, Santa Clara, and Alameda Counties, with sampling from April through June 2007.

Groundwater was sampled from 79 wells within the San Francisco Bay study unit to characterize its constituents and identify trends in groundwater quality through a spatially unbiased assessment of raw groundwater quality. Four grid cell wells (SF-03, SF-04, SF-05, and SF-06) and seven understanding wells (SFM-A1, SFM-A2, SFM-A3 SFM-A4, SFM-B1, SFM-B2, and SFU-01) are located in or near the South Westside Basin. The focus on raw water quality rather than treated water quality and the spatially unbiased nature of the program set it apart from other sampling programs that typically use available data from existing wells that are biased toward better water quality and have data intended to meet regulatory requirements for drinking water supplies.

The test results provide information to address a variety of issues ranging in scale from local water supply to statewide resource management. Full analysis of the results will be included in a future USGS report.

1.5.7 BAY AREA INTEGRATED REGIONAL WATER MANAGEMENT PLAN

The Bay Area Integrated Regional Water Management Plan (IRWMP) (RMC and Jones & Stokes, 2006) was developed through a Letter of Mutual Understanding by San Francisco Bay Area water, wastewater, flood protection, and stormwater management agencies; cities and counties represented by the Association of Bay Area Governments; and watershed management interests represented by the California Coastal Conservancy and non-governmental environmental organizations. The IRWMP outlines the region's water resource management needs and objectives, and presents innovative strategies and a detailed implementation plan to achieve these objectives, contributing to sustainable water resources management in the Bay Area.

The following are the overall objectives of the Bay Area IRWMP:

1) Foster coordination, collaboration and communication among Bay Area agencies responsible for water and habitat-related issues.

2) Achieve greater efficiencies and build public support for vital projects.

3) Improve regional competitiveness for project funding.

The Bay Area IRWMP identifies regional priority projects, including two in the South Westside Basin: the Lomita Canal / Cupid Row Canal Upgrades at San Francisco International Airport and SFPUC Groundwater Projects (including Lake Merced Project, Local Groundwater Projects, and the Regional Groundwater Storage and Recovery Project).

The Bay Area IRWMP will be going through an update during 2011 – 2012 to ensure that the IRWMP is in compliance with Proposition 84 requirements, including a climate change impact assessment and integrated flood management.

1.5.8 WATER SUPPLY AGREEMENT BETWEEN THE CITY AND COUNTY OF SAN FRANCISCO AND WHOLESALE CUSTOMERS IN ALAMEDA COUNTY, SAN MATEO COUNTY, AND SANTA CLARA COUNTY

The Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (Wholesale Water Supply Agreement) (July, 2009) defines the agreement for San Francisco to deliver, up to a defined quantity (Supply Assurance), water to the wholesale customers, including the water agencies in the South Westside Basin. The Supply Assurance includes the wholesale customers as a group, while Individual Supply Guarantees are defined for each agency (Table 1.2). These quantities are expressed in terms of daily deliveries on an annual average basis, although San Francisco agrees to operate the system to meet peak requirements to the extent possible without adversely impacting the ability to meet peak demands of retail customers.

The Wholesale Water Supply Agreement includes details on allocation, service areas, permanent transfers, resale, conservation, other supplies, water quality, maintenance, operation, shortages, wheeling, new customers, metering, the proposed conjunctive use program for the South Westside Basin, implementation of interim supply limitations, wholesale revenues, accounting, and other agreements.

Table 1.2 Individual Supply Guarantees

Wholesale Customer	Individual Supply Guarantee (mgd)	Water Purchases Fiscal Year 2009-2010 (mgd)*
California Water Services Company	35.68 (includes South San Francisco and areas outside the South Westside Basin)	32.6 (7.2 mgd for South San Francisco District)
City of Burlingame	5.234	3.9
City of Daly City	4.292	3.2**
City of Millbrae	3.152	2.2
City of San Bruno	3.246	1.5
Town of Hillsborough	4.090	3.0

* BAWSCA, 2011
** Amount shown does not include 1.9 mgd of in-lieu water purchases

1.5.9 Urban Water Management Plans

Urban water management plans (UWMP) include descriptions and evaluations of historical, current, and future sources of water supply; efficient uses of water; demand management measures; implementation strategies and schedules; and other information as required by the Urban Water Management Planning Act. They are important components for the planning process of each agency and values from these plans are used extensively in Section 3, Water Requirements and Supplies, of this GWMP.

A UWMP is required for water agencies with more than 3,000 customers or that provide over 3,000 AF of water annually. Within the South Westside Basin, UWMPs have been developed and adopted by Burlingame, Daly City, Hillsborough, Millbrae, San Bruno, and CalWater. In the North Westside Basin, SFPUC has developed a UWMP.

1.6 PUBLIC PROCESS IN DEVELOPING THE GROUNDWATER MANAGEMENT PLAN

The development of any GWMP is a collaborative process involving all interested stakeholders. Public input is critical to the success of the South Westside Basin GWMP and was a key component of its development.

The public was informed and encouraged to provide input and participate in the development of the GWMP in the following ways:

- GWMP web site: **www.southwestsideplan.com** provided information to the public regarding the GWMP. Details about groundwater management in general and specific to the South Westside Basin were provided. Meeting dates, locations, and materials were posted along with details of the South Westside Basin GWMP Advisory Committee (Advisory Committee) and contact information.
- Newspaper advertisements in the San Mateo County Times gave notice of public hearings.
- Public hearings provided opportunities for personal communications captured in the public record on specific topics, including resolution of intent to draft a GWMP and resolution of adoption of the GWMP.
- Public meetings provided details on the GWMP process and solicited input.
- Advisory Committee meetings provided detailed technical information on the GWMP and solicited input.
- Direct communication by telephone, email, and mail was encouraged at meetings and on the web site. Comments could be sent to the City of San Bruno project manager, local water agency staff, or the consultant project manager.

1.6.1 JUNE 2009 PRESENTATION TO IRRIGATION PUMPERS IN THE SOUTH WESTSIDE BASIN

A presentation on the South Westside Basin GWMP was given on June 25, 2009 to cemetery and golf course interests as part of a SFPUC meeting on the proposed GSR and its potential impacts and benefits for cemeteries and golf courses. The meeting was held at 10:30 a.m. at the Colma Town Hall. The presentation gave an overview of groundwater planning, the proposed GWMP, and the process of developing the GWMP. Attendees were invited to provide contact information and to continue to provide guidance as the GWMP is developed and implemented. Copies of the presentation were provided to interested parties via email. Attendees included representatives from the following:

- Holy Cross Cemetery
- Lake Merced area golf courses
- Town of Colma

- City of Daly City
- City of San Bruno
- SFPUC

1.6.2 PUBLIC HEARINGS

1.6.2.1 Intent to Adopt

A public hearing of Intent to Adopt a Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on August 24, 2010 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Times*, on August 10, 2010 and August 17, 2010. A resolution was adopted by the City Council and subsequently was published in the San Mateo Times on September 8, 2010 and September 15, 2010. The advertisements and the resolution are included in Appendix A.

1.6.2.2 Adoption

A public hearing to adopt the Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on July 10, 2012 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Tim*es twice prior to the hearing. The advertisements and the resolution are included in Appendix A.

1.6.3 PUBLIC MEETINGS

A total of five public meetings were held to inform the public on the development of the groundwater management plan.

1.6.3.1 Background, Components, and Process

Three public meetings were held at locations across the South Westside Basin to provide information on the importance of groundwater as a water supply, the need for management of the groundwater resource, the role of a GWMP, the role of the public in the development and implementation of the GWMP, and the preliminary goals, objectives, and elements of the groundwater management plan.

1.6.3.1.1 San Bruno Presentation

The presentation in the southern portion of the South Westside Basin was given at San Bruno City Hall on Thursday September 9, 2010 at 5:30 pm. The meeting was advertised on San Bruno's cable television station, noticed at City Hall, and advertised in the *San Mateo Times* on September 4, 2010.

1.6.3.1.2 Daly City Presentation

A presentation in the northern portion of the South Westside Basin at was given at Daly City City Hall on Thursday September 23, 2010 at 7:00 pm. The meeting was noticed at City Hall, on the city's web page, and on the city's cable television station. Interviews were provided to a student from San Francisco State University for airing on the campus radio station, KSFS.

1.6.3.1.3 Colma Presentation

The presentation in the central portion of the South Westside Basin was given at Colma Town Hall on Thursday October 13, 2010 at 11:30 am. The meeting was noticed at Town Hall. Extensive personal outreach was conducted to inform the numerous cemeteries that utilize private groundwater wells for their irrigation supply.

1.6.3.2 Draft Plan Presentation

The fourth public meeting was held at Colma Town Hall on May 24, 2011 at 11:30am. The meeting was noticed at Town Hall and outreach was performed to inform the cemeteries. The draft Groundwater Management Plan was presented and stakeholders were provided an opportunity to discuss the draft Plan and provide comments either in person or at a later date.

1.6.3.3 Distribution of Draft GWMP

The draft text of the GWMP was distributed to the public for comment on May 10, 2012. The comment period extended until June 9, 2012. One email was received with comments, which were addressed.

1.6.3.4 Final Draft Plan Presentation

The fifth public meeting was held at San Bruno City Hall on May 23, 2012 at 5:30 pm. The meeting was noticed at City Hall and advertised in the *San Mateo Times* on May 20, 2012. The final draft Groundwater Management Plan and the activities moving forward were discussed.

1.7 SOUTH WESTSIDE BASIN GWMP ADVISORY COMMITTEE

The Advisory Committee was organized to solicit input and direct the development of the GWMP. Agencies and key stakeholders were provided written invitations to send to their representatives to invite them to participate in the Advisory Committee. Other stakeholders were invited to join through the public notification process, hearings, the web site, and public meetings. Table 1.3 lists the Advisory Committee members and their affiliations. Meetings were held from 2009 through 2011 to coordinate stakeholder input and incrementally build the GWMP. Agendas and minutes are included in Appendix A.

During implementation of the GWMP, it is anticipated that most of the members of the Advisory Committee will join the Groundwater Task Force. The Groundwater Task Force will guide the implementation of the GWMP and is described in more detail in Section 6.1.

Table 1.3 Advisory Committee Members

Entity	Representative
Bay Area Water Supply and Conservation Agency	Anona Dutton
City of Brisbane	Randy L. Breault
City of Burlingame	Phil Monaghan
California Water Services Company	Tom Salzano
DWR	Mark Nordberg
Cemeteries	Roger Appleby
Town of Colma	Brad Donohue
City of Daly City	Patrick Sweetland
RWQCB	Kevin D. Brown
City of San Bruno	Will Anderson
SFPUC	Greg Bartow
City of South San Francisco	Terry White
Interested citizens	Robert Riechel

1.7.1 December 18, 2009 Advisory Committee Meeting 1

An Advisory Committee meeting was held on December 18, 2009 to coordinate the Advisory Committee, develop a common understanding of basin conditions and groundwater management plans, and to develop a goal or goals for the basin. The meeting was held at San Bruno City Hall and was well attended, including representatives of the following:

- California Water Services Company
- City of Brisbane
- City of Burlingame
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Private citizens
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.2 March 11, 2010 Advisory Committee Meeting 2

The second Advisory Committee meeting was held on March 11, 2010 to discuss Basin Management Objectives (BMOs), both in general and specific to the South Westside Basin. The meeting was held at San Bruno City Hall and was attended by representatives of the following:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.3 June 24, 2010 Advisory Committee Meeting 3

An Advisory Committee meeting was held on June 24, 2010 to discuss comments received on the BMOs and to discuss the Elements of the Plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma

The meeting minutes are included in Appendix A.

1.7.4 August 16, 2010 Advisory Committee Meeting 4

An Advisory Committee meeting was held on August 16, 2010 to discuss basin governance and financing of the implementation of the groundwater management plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC

- Town of Colma

The meeting minutes are included in Appendix A.

1.7.5 February 3, 2011 Advisory Committee Meeting 5

An Advisory Committee meeting was held on February 3, 2011 to discuss the recent completion of a revision to the Westside Basin Groundwater Flow Model and the utility of the model in the development of the GWMP. The discussion included using the model to estimate the basin yield. The meeting was held at San Bruno City Hall and was attended by representatives of:

- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.6 April 28, 2011 Advisory Committee Meeting 6

An Advisory Committee meeting was held on April 28, 2011 to update the current status of the Groundwater Management Plan to provide information to focus the review to be performed by the Advisory Committee. Progress toward participation in the CASGEM program was also discussed.

The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

1.7.7 April 15, 2011 Distribution of Draft GWMP

The draft text of the GWMP was distributed to the Advisory Committee for comment on April 15, 2011. Comments were received from BAWSCA, CalWater, San Bruno, SFPUC, and Steve Lawrence and incorporated into the text as appropriate.

1.8 GROUNDWATER MANANGEMENT PLAN AND CONSISTENCY WITH CALIFORNIA WATER CODE

Groundwater management is the planned and coordinated local effort of sustaining the groundwater basin in order to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating GWMPs (California Water Code, § 10750 et. seq.). SB 1938, passed in 2002, further emphasizes the need for groundwater management in California. SB 1938 requires AB 3030 GWMPs to contain specific plan components in order to receive state funding for water projects.

The South Westside Basin Groundwater Management Plan is prepared consistent with the provisions of California Water Code § 10750 et seq. as amended January 1, 2003. The South Westside Basin GWMP includes the seven components that are required to be eligible for DWR funds for the construction of groundwater projects or groundwater quality projects. The GWMP also addresses the 12 specific technical issues identified in the Water Code along with the seven recommended components identified in DWR Bulletin 118-03 (DWR, 2003). Table 1.4 lists the required and recommended components and identifies the specific section of this GWMP in which the components are discussed.

Table 1.4 South Westside Basin GWMP Components

Component	GWMP Section(s)
SB 1938 Mandatory	
1. Documentation of public involvement	1.6, 1.7, App. A
2. BMOs	4.3
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality	5.2
4. Plan to involve other agencies located in the groundwater basin	5.1
5. Adoption of monitoring protocols	5.2, App. C
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with boundaries of agencies subject to the GWMP	Figures 1.1, 1.2, and 1.3
7. For agencies not overlying groundwater basins, GWMP prepared using appropriate geologic and hydrogeologic principles	n/a
AB 3030 and SB 1938 Voluntary	
1. Control of saline water intrusion	5.4.1
2. Identification and management of well protection and recharge areas	5.4.2
3. Regulation of the migration of contaminated groundwater	5.4.3
4. Administration of well abandonment and destruction program	5.4.4
5. Control and mitigation of groundwater overdraft	5.3.1
6. Replenishment of groundwater	5.3.2
7. Monitoring of groundwater levels	5.2.1, App. C
8. Development and operation of conjunctive use projects	5.3.3
9. Identification of well construction policies	5.4.5
10. Construction and operation of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	5.5
11. Development of relationships with state and federal regulatory agencies	5.6.1
12. Review of land use plans and coordination with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	5.6.3
DWR Bulletin 118 Recommended	
1. Management with guidance of advisory committee	1.7, 5.1
2. Description of area to be managed under GWMP	1.1, Figures 1.1, 1.2, and 1.3
3. Links between BMOs and goals and actions of GWMP	4, 6
4. Description of GWMP monitoring programs	5.2, App. C
5. Description of integrated water management planning efforts	1.5, 5.6.2
6. Report of implementation of GWMP	5.7
7. Periodic evaluation of GWMP	5.7

2.1 CLIMATE

The South Westside Basin's location in a valley between the Pacific Ocean and San Francisco Bay gives it a variable, but mild, marine climate. Winters are mild and moderately wet and summers are cool and dry (National Oceanic and Atmospheric Administration, 2009). The valley serves as a gap in the coast range, allowing cool, moist marine air into the central Bay Area. Generally, areas closer to the Pacific Ocean or closer to the valley experience the most marine effects, notably lower summer temperatures and lower evapotranspiration, while those areas in the south of the basin, such as Burlingame, experience less marine influence and have more sunshine, higher summer temperatures, and higher evapotranspiration rates.

This climate, along with limited outdoor water use, contributes to water demand that is only somewhat higher in the summer than in the winter. Average monthly temperature and reference evapotranspiration data are shown in Table 2.1. Temperature data are from San Francisco International Airport (SFIA), within the Plan Area; however, the closest reference evapotranspiration data is from Woodside, south of the Plan Area. Temperature, evapotranspiration, and rainfall are variable in the basin and are driven by proximity to the Pacific Ocean and local topography. Areas closer to the ocean are cooler and cloudier, with lower evapotranspiration. Higher elevation areas have more rainfall.

Table 2.1 Average Monthly Temperature and Reference Evapotranspiration

Parameter	Month												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average maximum temperature (°F)*	55.8	59.1	61.2	63.8	66.8	70.0	71.4	72.1	73.5	70.1	62.9	56.4	65.3
Average minimum temperature (°F)*	42.5	45.0	46.2	47.7	50.3	52.7	54.1	55.0	54.9	51.9	47.4	43.2	49.2
Precipitation (inches)**	4.4	3.6	2.8	1.4	0.4	0.1	0.0	0.1	0.2	1.0	2.3	3.7	20.0
Average reference evapotranspiration (inches)***	1.83	2.21	3.42	4.84	5.61	6.26	6.47	6.22	4.84	3.66	2.36	1.83	49.54

* Source: Western Regional Climate Center, 2011. San Francisco WSO AP, California (047769). Period of record 7/1948 – 9/2010.
** Source: NOAA-NCDC, 2007, 2009, 2011
*** Source: California Irrigation Management Information System (CIMIS), 2009. 96 Woodside. Period of record 10/1990 – 1/1994

The National Weather Service through its Cooperative Network collects rainfall data at SFIA: Coop ID #047769 (see Figure 2.1). Data are available from May 1928 through present.

The historical record of annual rainfall and the cumulative departure from annual mean at SFIA are shown in Figure 2.2. The long-term average annual precipitation for the period from 1949 to 2010 is 20 inches. Figure 2.3 shows the long-term average monthly precipitation at SFIA. Most precipitation occurs as rainfall during the mild winters, from November through April. A map of the spatial distribution of precipitation by HydroFocus (2011) is shown in Figure 2.4. Across the basin, annual precipitation ranges from less than 20 inches along San Francisco Bay near SFIA and along the Pacific Ocean in Daly City to approximately 24 inches in the center of the valley near Colma and South San Francisco to approximately 30 inches in the hills above the valley.

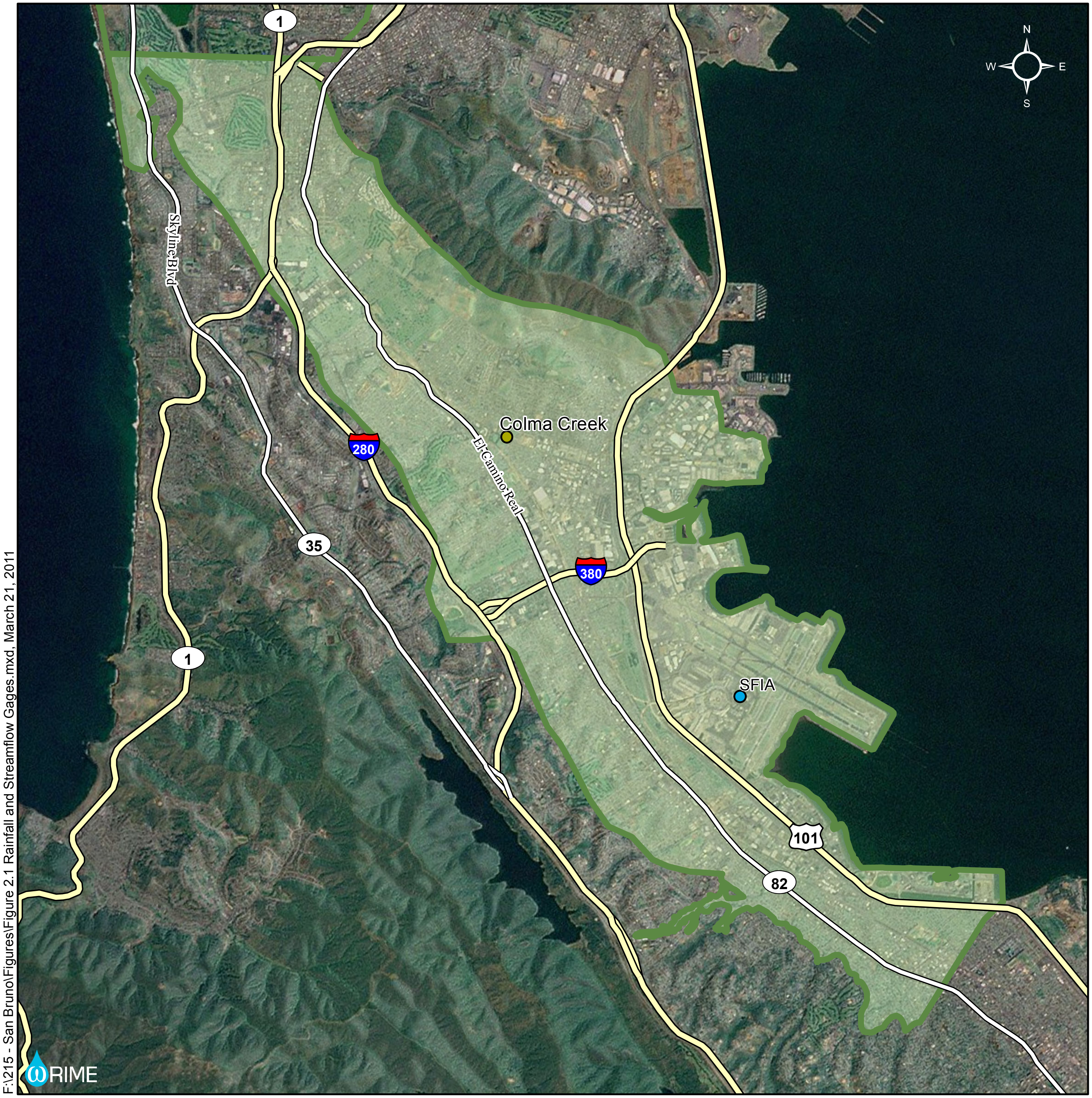


Figure 2.1
Rainfall and Streamflow Gages

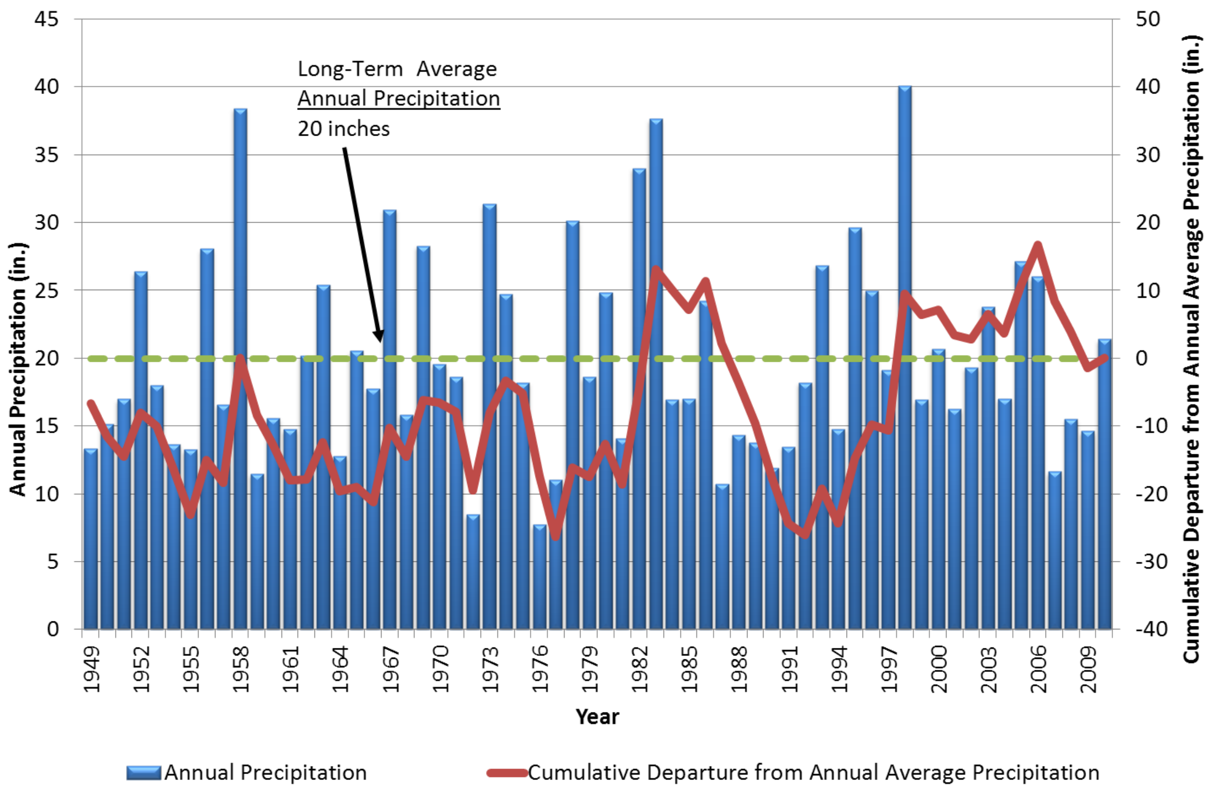
Legend

- Highways
- Groundwater Basin
- Plan Area
- NOAA Precipitation Gage
- USGS Streamflow Gage

0 0.5 1 2 Miles

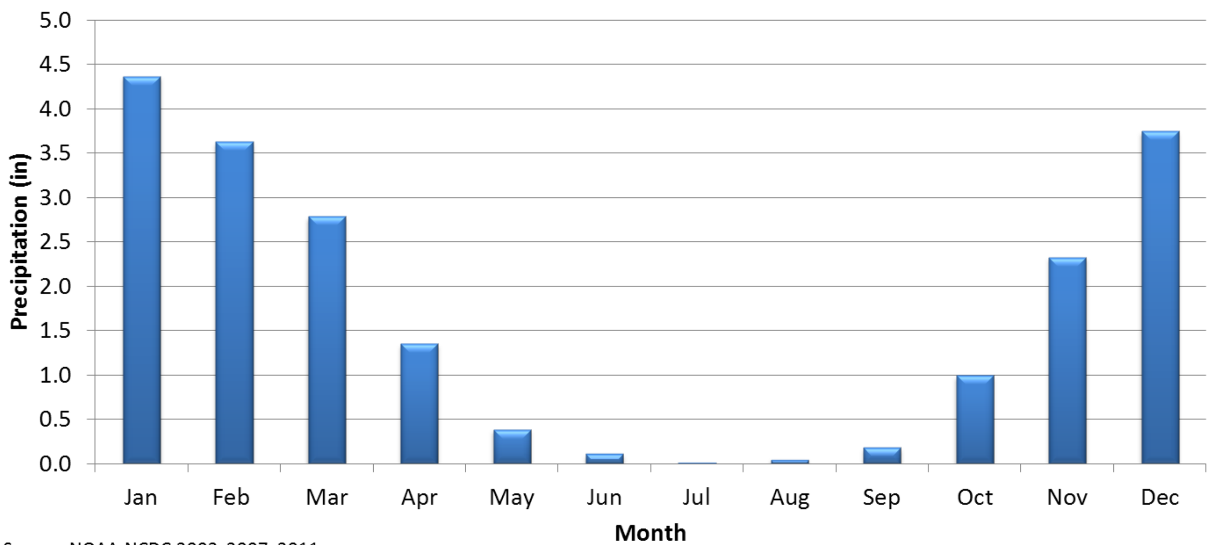
F:\215 - San Bruno\Figures\Figure 2.1 Rainfall and Streamflow Gages.mxd, March 21, 2011

WRIME



Data Source: NOAA-NCDC, 2002, 2007, 2011.

Figure 2.2 Historical Annual Precipitation and Cumulative Departure from Mean Precipitation



Source: NOAA-NCDC 2002, 2007, 2011

Figure 2.3 Average Monthly Precipitation

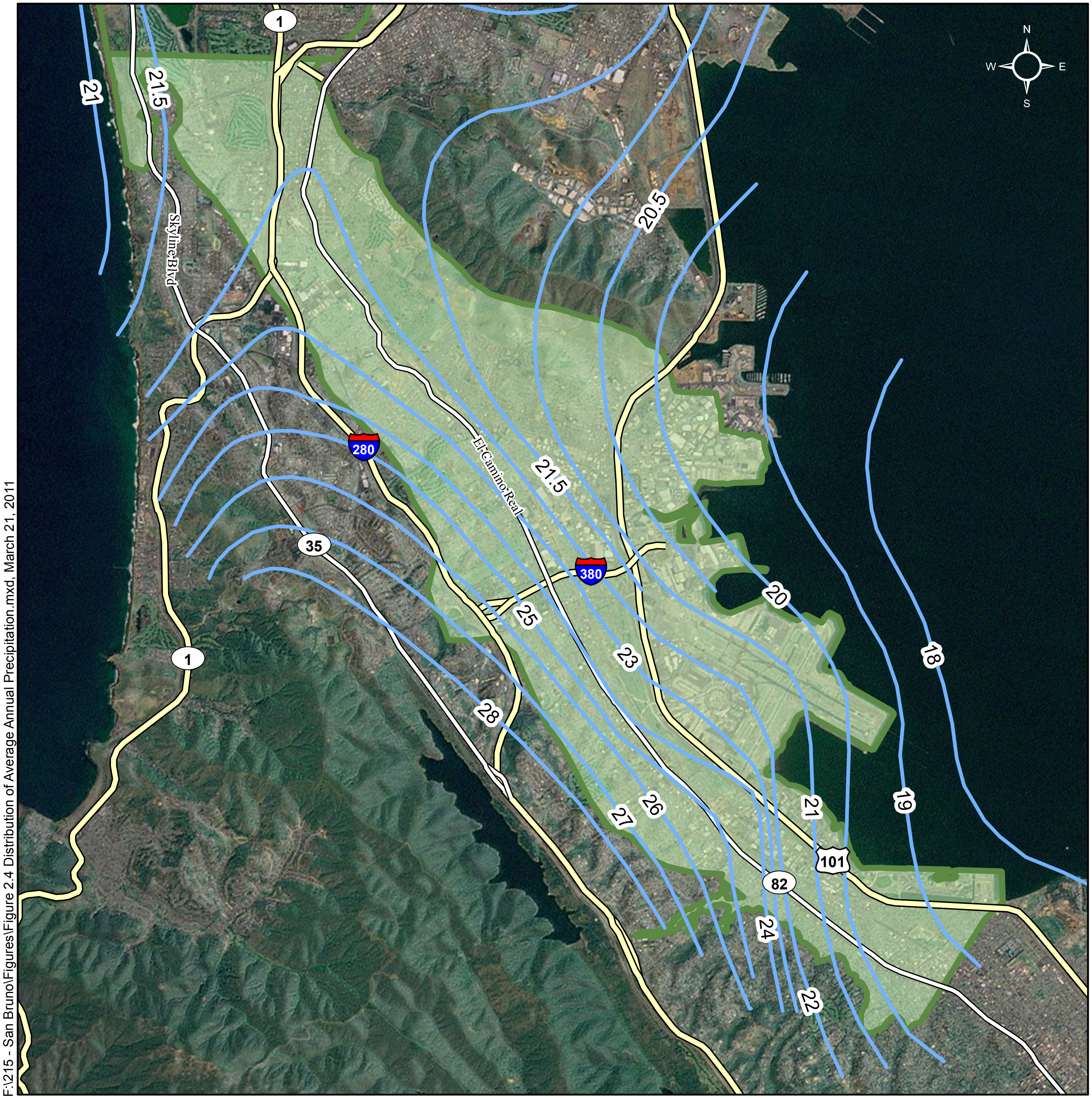


Figure 2.4
Distribution of Average Annual Precipitation

Legend

- Precipitation (in)
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: Precipitation - HydroFocus, 2011

F:\215 - San Bruno\Figures\Figure 2.4 Distribution of Average Annual Precipitation.mxd, March 21, 2011

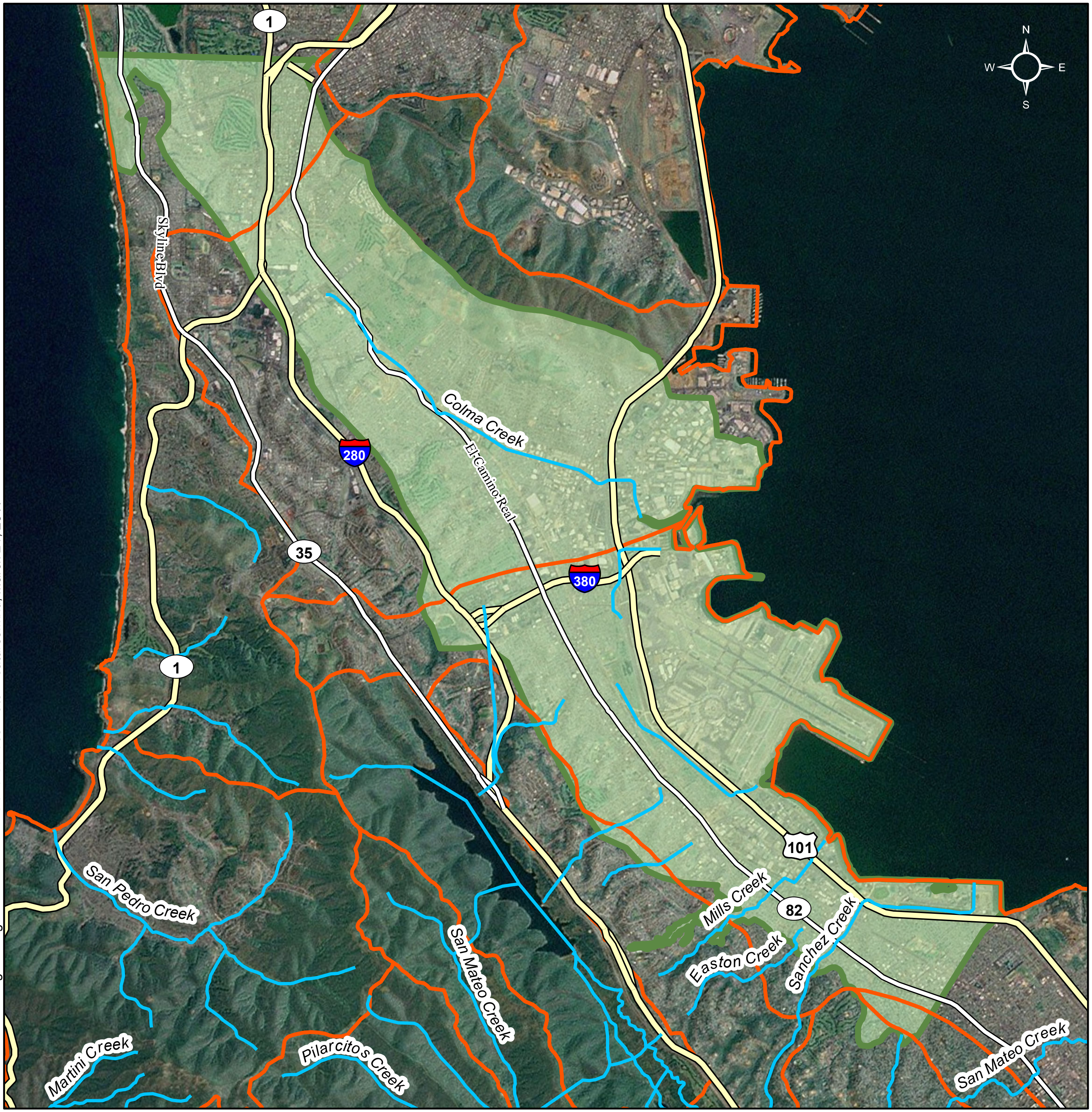
2.2 SURFACE WATER

Major watersheds and surface water features are shown in Figure 2.5. The largest watersheds are Colma Creek Watershed and Vista Grande Watershed.

Colma Creek is a small creek draining much of South San Francisco and the surrounding area before entering into San Francisco Bay just north of SFIA and the eastern terminus of Interstate 380. Within the valley portion of the watershed, Colma Creek is an open engineered channel from the bay to near the Colma/South San Francisco city line. Much of the area upstream of South San Francisco and some small tributaries within South San Francisco drains through underground storm drains. Some of the uppermost reaches of the creek are natural channels, particularly on the slopes of San Bruno Mountain (Oakland Museum of California, 2011).

The only USGS streamflow gage in the South Westside Basin was located on Colma Creek (Figure 2.1). No longer active, the gage has recorded data from 1963 until 1996. Average monthly flows from the gage are presented on Figure 2.6a and the percent exceedance of daily streamflow is shown in Figure 2.6b. Average monthly streamflow is low, less than 5 cubic feet per second (cfs) in the summer and less than 20 cfs in the winter. High flow conditions are typically below 200 cfs. Work has been performed on the stream channel to reduce flooding in the area, particularly near Holy Cross Cemetery.

Figure 2.5
Watersheds and Surface Water Features



Legend

- Creeks/Streams
- Highways
- Watersheds
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: NHD database and USGS

F:\215 - San Bruno\Figures\Figure 2.5 Watersheds and Surface Water Features.mxd, March 21, 2011

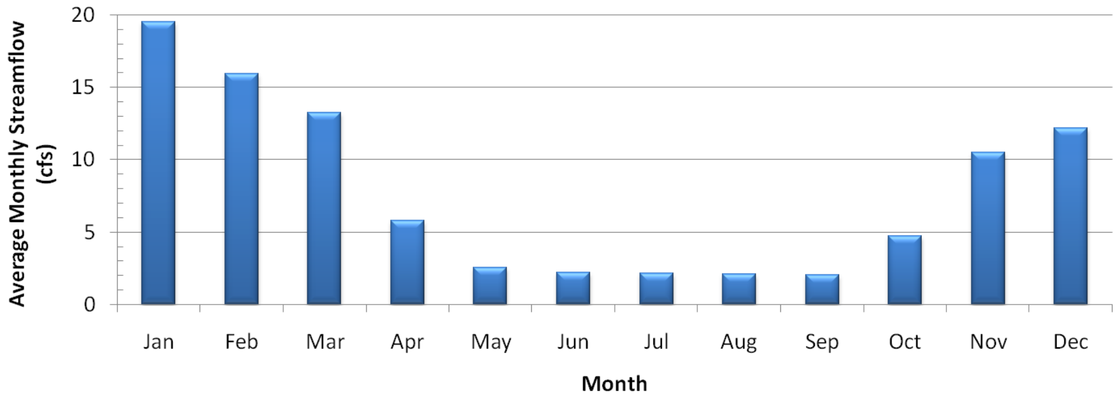


Figure 2.6a Average Monthly Colma Creek Streamflow, 1963-1996

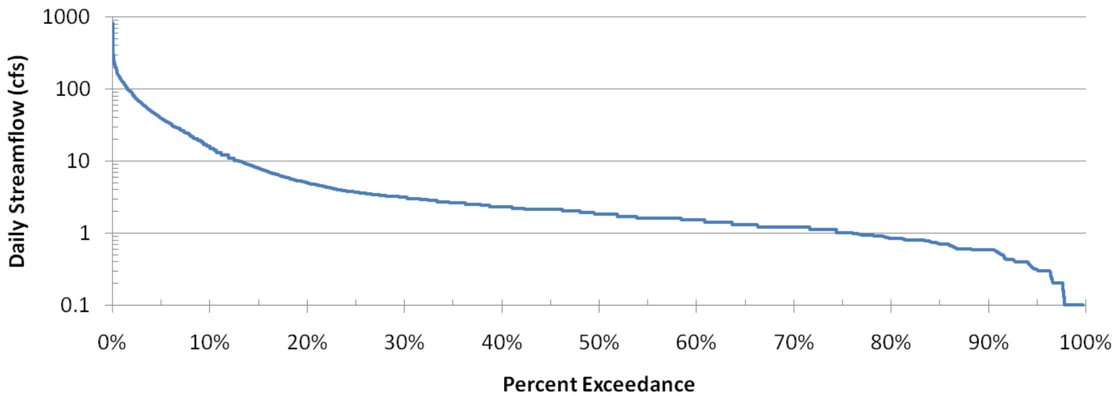


Figure 2.6b Daily Colma Creek Streamflow Exceedance, 1963-1996

The Vista Grande Watershed historically drained into Lake Merced, but has since been altered to flow to the Pacific Ocean. The 2.5 square mile watershed includes portions of Daly City as well as portions of unincorporated San Mateo County. Stormwater flows through the Vista Grande Canal for about 3,500 feet before flowing into the Vista Grande Outfall Tunnel. The tunnel discharges to the Pacific Ocean through an outfall beach structure below Fort Funston in Golden Gate National Recreation Area. (RMC, 2006)

Other creeks in the South Westside Basin include:

- San Bruno Creek in San Bruno
- Millbrae Creek in Millbrae
- Mills Creek in Burlingame
- Sanchez Creek in Burlingame

- o San Mateo Creek, just south of the South Westside Basin in San Mateo

The major water features in the North Westside Basin are Lake Merced and several smaller lakes. These features, as they relate to groundwater, are discussed in the draft North Westside Basin GWMP.

2.3 GROUNDWATER

2.3.1 GEOLOGIC SETTING

The South Westside Basin is a structural basin within the Coast Ranges province of California. The Coast Ranges are dominated by northwest oriented mountain ranges and valleys. The mountains are steep but modest in elevation. Locally, the Santa Cruz Mountains and the valley that makes up the South Westside Basin are part of these features. Highest elevations include the following:

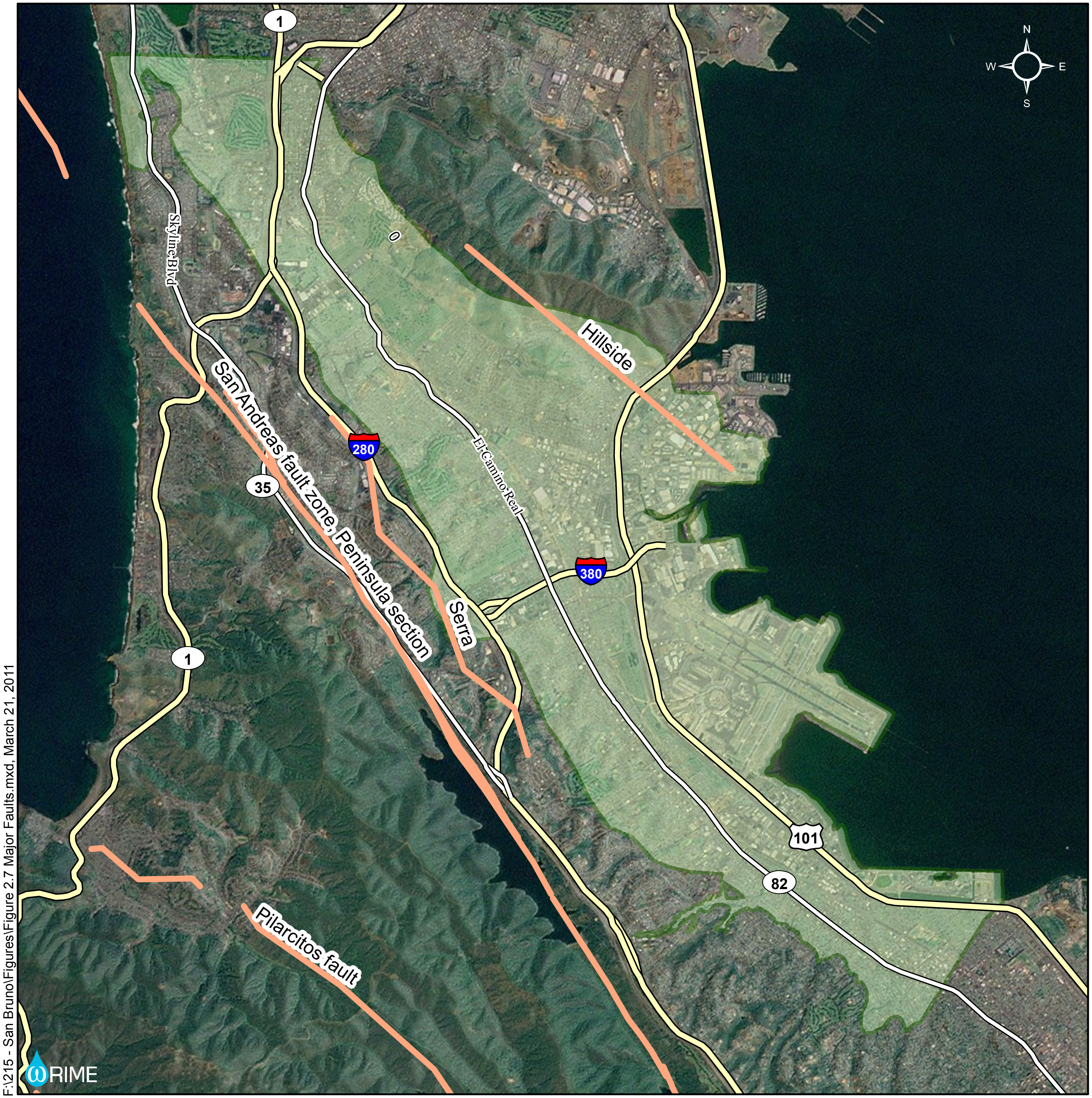
- o Scarpet Peak southwest of the basin, 1,944 feet (ft)
- o San Bruno Mountain northeast of the basin, 1,316 ft
- o Mount Davidson in San Francisco, 927 ft

The northwest trend is a result of tectonics, with major northwest trending faults in the vicinity of the South Westside Basin: San Andreas Fault, Serra Fault, and the Hillside Fault (Figure 2.7)

The Franciscan Formation forms the basement underlying the unconsolidated sediments that are the primary sources of groundwater for the area and forms most of the mountains surrounding the South Westside Basin (Burns & McDonnell and ERM-West, 2006; Bonilla 1998). A map of bedrock elevation is presented on Figure 2.8 based on HydroFocus (2003). The Mesozoic-age formation is highly deformed and comprised of a unique mix of rocks related to tectonic subduction. This subduction resulted in materials from the oceanic plate being scraped off and accreted onto the continental materials as well as low-temperature, high-pressure metamorphism. The scraping results in the presence of deep-ocean materials such as chert, while metamorphism results in rocks such as serpentine and blueshist. The most common materials are greywacke (a poorly sorted sandstone containing angular clasts) and shale, resulting from deep ocean deposition in a method similar to a landslide. Composition of the Franciscan Formation is variable; locally the Franciscan has significant greywacke and shale in what is known as the San Bruno Mountain terrane to the northeast of the South Westside Basin and pillow basalts, minor chert, limestone, and greywacke in what is known as the Permanente terrane to the southwest (Sloan, 2006).

The Merced Formation and the Colma Formation are the major unconsolidated units in the South Westside Basin and are the primary sources of groundwater. These formations were

Figure 2.7
Major Faults



Legend

Highways

Plan Area

Faults

0 0.5 1 2 Miles

Source: USGS

F:\215 - San Bruno\Figures\Figure 2.7 Major Faults.mxd, March 21, 2011

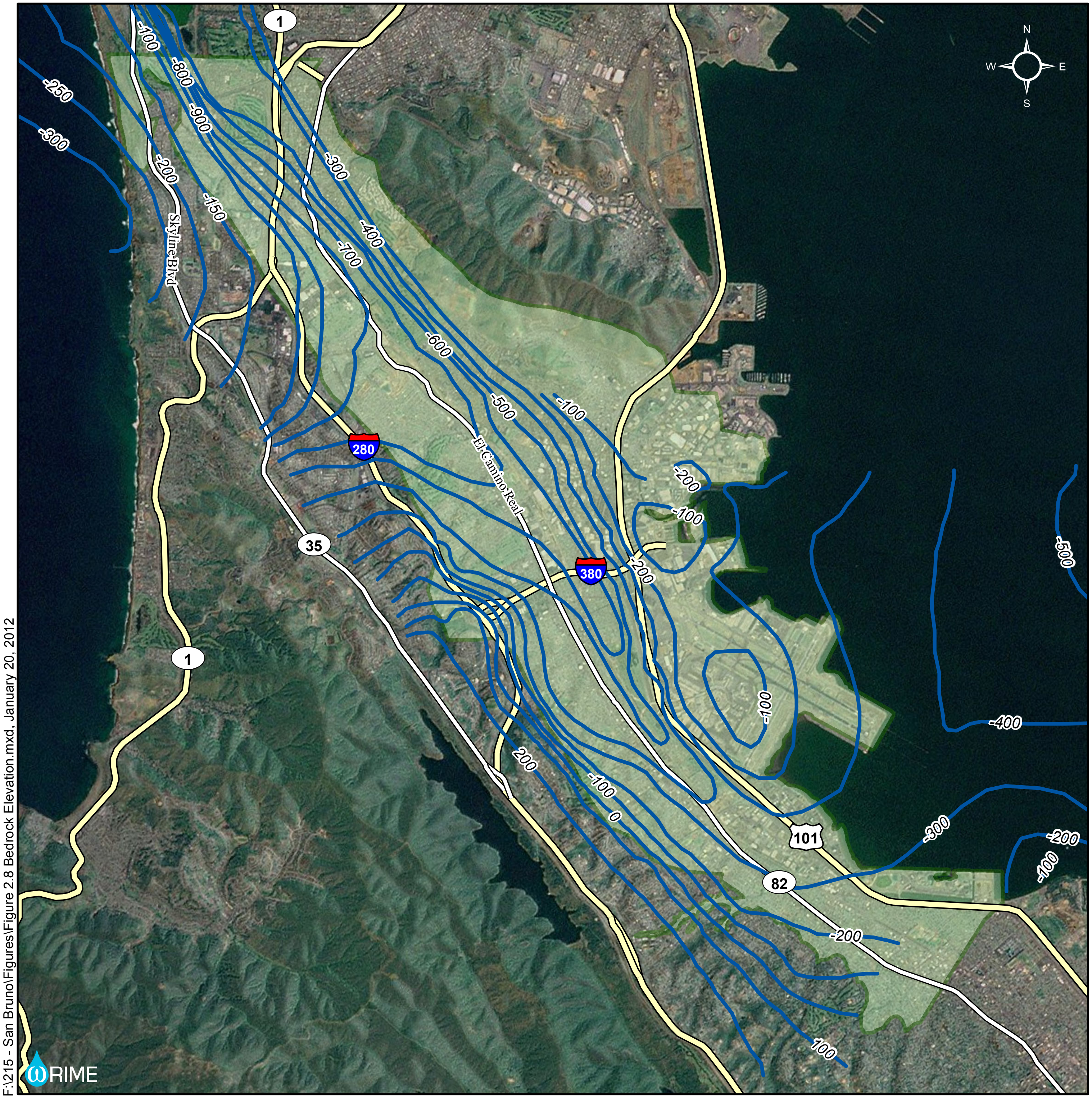


Figure 2.8
Bedrock Elevation

Legend

- Highways
- Plan Area
- Bedrock Elevation (ft)

0 0.5 1 2 Miles

Source: Bedrock Elevation -
Phillips et al., 1993 and
Hensolt and Brabb, 1990
as cited in HydroFocus, 2003

F:\215 - San Bruno\Figures\Figure 2.8 Bedrock Elevation.mxd, January 20, 2012

RIME

deposited on top of the Franciscan. During recent geologic history, the South Westside Basin alternated between being submerged below the Pacific Ocean and being above sea level, the result of tectonic subsidence, changes in sea level due to global climatic conditions, and tectonic uplift. At least 30 episodes of transgression and regression are recorded in the Merced and Colma Formations near Daly City (Clifton and Hunter, 1987, 1991) as changes from shallow marine to non-marine sediments. These episodes resulted in the layers of clays and sands seen in the subsurface today.

The Merced Formation contains several major beds of sands and clays. The lower portion of the formation contains locally derived materials from the Coast Ranges, while the upper portion contains sediment from the Sierra Nevada and Cascades identifying the movement of the outlet of the Sacramento and San Joaquin rivers near their current outlet at the Golden Gate.

Beds in the vicinity of coastal Daly City dip to the northeast at 45 to 70 degrees in the lower 4,000 ft; 25 to 45 degrees in the middle 600 ft; and 5 to 20 degrees in the upper 500 ft (LSCE, 2004). The Merced Formation dips more than 40 degrees to the northeast in the portion of the South Westside Basin from San Bruno to Daly City (Fio and Leighton, 1995). From San Bruno into Millbrae and between the Serra and San Andreas faults, the Merced dips to the southwest and to the northeast, depending on location, due to faulting and folding (Rogge, 2003). East of the Serra Fault, the Merced appears to dip to the northeast based on observations by Rogge.

The Colma Formation has a very similar mineral composition to the underlying Merced Formation. The Colma Formation is younger (Pleistocene-age) than the Merced and was deposited on top of the tilted Merced Formation. The layering in the Colma Formation remains primarily horizontal (Sloan, 2006).

Bay Muds are also present along the margins of San Francisco Bay at ground surface or below artificial fill. These recently deposited materials are fine-grained clays and silts with organic matter and minor sand lenses that were deposited in still waters and accumulated as sea levels rose (Lee and Praszker, 1969).

2.3.2 WATER-BEARING FORMATIONS

Groundwater used for water supply within the South Westside Basin is found in the Merced and Colma formations discussed above. Water is produced from the coarse-grained layers within these complex, layered formations. Grain size typically decreases from the northwest to the southeast.

The elevation of the bedrock surface is shown in Figure 2.8; the deepest portions of the basin is in the northwest, becoming thin in Millbrae and south into Burlingame. Water bearing formations are also thin near San Francisco Bay due to a bedrock ridge extending in a north-south orientation near SFIA, which, together with surficial deposits of Bay muds in these areas, reduces the potential for seawater intrusion in this area (WRIME, 2007).

The "W" clay is a major aquitard in the Daly City area, with municipal production occurring below the "W" clay. The "W" clay is not present south of Daly City, but a fine grained unit at 300 ft below mean sea level is present in the South San Francisco area (LSCE, 2004) and several clay units are in the upper portion of the aquifer in the San Bruno area. Perched aquifer conditions occur throughout the Plan Area. Numerous shallow wells installed for remediation or monitoring of contaminants nearly always encounter the water table within 30 feet of ground surface (HydroFocus, 2003).

The characteristics of the water bearing formations have been studied through several aquifer tests outlined in the *Alternatives Analysis Report* (MWH, 2007) and are summarized below. These tests provide estimates of transmissivity, a measure of the ability of an aquifer to transmit groundwater. For the South Westside Basin as a whole, previous studies have shown a range of transmissivities of 668 to 4,100 ft^2/day (CH2M HILL, 1997 *as referenced in* MWH, 2007). More specifically, transmissivities have been estimated for the following:

- Daly City area at the Jefferson Well as 2,190 ft^2/day
- CalWater wellfield area as 1,000 to 20,000 ft^2/day
- San Bruno area at SB-16 as 1,890 ft^2/day (LSCE, 2004; MWH, 2007)

2.3.3 Partial Barriers to Seawater Intrusion

The lack of historical seawater intrusion despite historical data of groundwater levels below sea level near both the Pacific Ocean and San Francisco Bay is likely due to natural hydrogeologic conditions that act as partial barriers and inhibit the flow of water from these saltwater bodies into the freshwater aquifer.

2.3.3.1 Pacific Ocean

Significant faulting and folding of the Merced Formation near the Pacific Ocean has been shown to be a barrier to seawater intrusion from the Pacific Ocean. It has been concluded that groundwater extraction within the South Westside Basin largely occurs within sequences with no direct connection with the Pacific Ocean (LSCE, 2010). Monitoring wells at Thornton Beach and Fort Funston exhibit groundwater levels above sea level. The potential for seawater intrusion is more likely to the north of Fort Funston, in the vicinity of LMMW-6D, where the faulted and folded conditions do not exist and there is a potential pathway into the South Westside Basin from the northwest. This area, however, is farther from the influence of active production wells and water levels are thus higher than elsewhere in the South Westside Basin. A network of monitoring wells are used to collect groundwater data along the Pacific Ocean: at the Old Great Highway, the northwestern part of Golden Gate Park, the Oceanside Wastewater Treatment Plan, the San Francisco Zoo, Fort Funston, and Thornton Beach.

2.3.3.2 San Francisco Bay

Relatively thick Bay Mud deposits and a buried bedrock ridge within 50 to 300 ft of the land surface provide some protection to the southern portion of the South Westside Basin from seawater intrusion from San Francisco Bay. Previous efforts have identified areas where the depth to bedrock is deepest and installed monitoring well clusters in the two most likely locations for seawater intrusion. These wells (SFO-S, SFO-D, Burlingame-S, Burlingame-M, and Burlingame-D) provide water level and water quality data. While this barrier has been historically effective, hydraulic connections between the main pumping aquifer and shallower wells closer to the Bay have been shown through water level impacts when San Bruno groundwater production wells are turned on (impacts at SFIA monitoring wells; ERM (2005)) and through depressed water levels near the bayshore (including SFO-S, SFO-D, Burlingame-S, Burlingame-M, and Burlingame-D). While not a completely understood pathway from San Francisco Bay into the main pumping aquifer, this hydraulic connection indicates that there is some potential for seawater intrusion in the future in this area. Risks of seawater intrusion increase with greater gradients between depressed groundwater levels in the drinking water aquifer and sea level at San Francisco Bay. Such risks can be reduced through increasing groundwater levels by increased recharge or decreased groundwater production.

2.3.4 SOILS

Surface soils impact the amount of water that infiltrates to groundwater rather than contributing to surface runoff. The characteristics of surface soils thus play a role in groundwater recharge. Due to the urban nature of the area, the U.S. Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) does not have a comprehensive classification of these soils according to their infiltration capacity. However, USDA-NRCS does summarize the general soils for the area (Figure 2.9). Generally, soils in the northwest (Daly City and Colma) are well drained soils associated with former sand dunes (categorized as "Urban land-Orthents, smoothed"). Soils in the southeast (San Bruno, Millbrae, and Burlingame) have variable drainage properties in the low elevations near and to the east of El Camino Real (categorized as "Urban land-Orthents, reclaimed" and "Urban land-Orthents") and are well drained in the uplands to the west of El Camino (categorized as "Urban land-Orthents, cut and fill").

2.3.5 Recharge

Additional water is added to the aquifer system through recharge, the percolation of water downward from the ground surface through unsaturated sediments into the aquifer. The amount of recharge is controlled by

- Climate, including precipitation and evapotranspiration
- The slope of the ground surface, which impacts whether water seeps into the ground or becomes runoff into surface drainages
- Land use, including the amount of impervious surfaces, plant types, and usage of irrigation
- Leakage from water and sewer pipes
- Soil characteristics
- Subsurface characteristics

Estimates of recharge for the South Westside Basin were developed for the Groundwater Model (HydroFocus, 2011) and are summarized in Figure 2.10. The recharge estimates show that groundwater recharge is highest in the northwestern portions of the basin, corresponding to areas of sandy soils, and in areas with significant unpaved, irrigated land, such as golf courses and cemeteries. Recharge is lowest along the margins of San Francisco Bay, corresponding to areas with Bay Muds, and along the steep slopes of San Bruno Mountain.

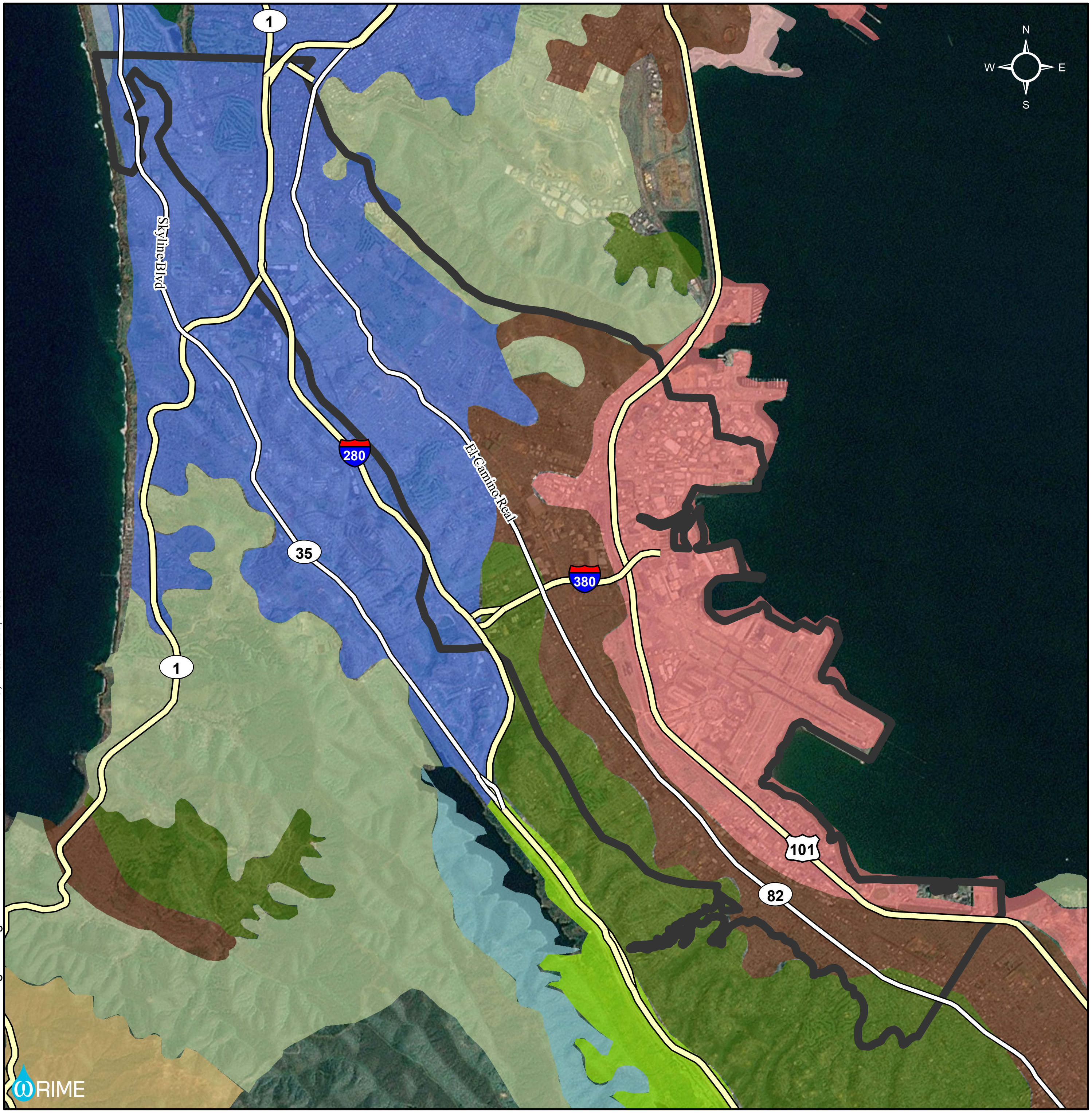


Figure 2.9
General Soil Classification

Legend

Highways

Plan Area

Soil Types

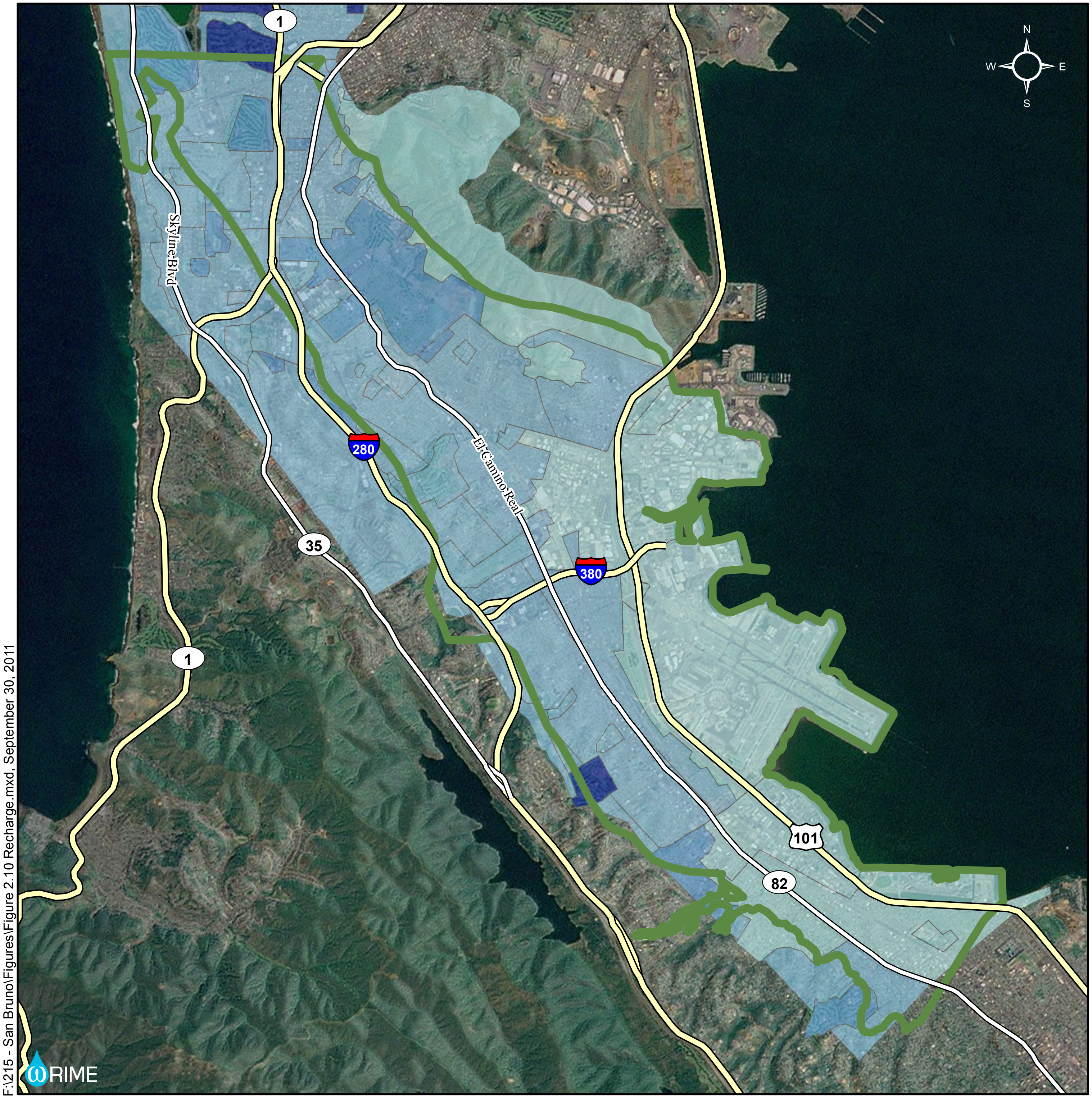
- Urban Land-Sirdrak
- Urban Land-Orthents, smoothed
- Alambique-McGarvey
- Scarper-Miramar
- Barnabe-Candlestick-Buriburi
- Fagan-Obispo
- Urban Land-Orthents, cut and fill
- Alambique-Zeni-Zeni Variant
- Novato-Reyes
- Urban Land-Orthents, reclaimed
- Urban Land-Orthents

0 0.5 1 2 Miles

Source: Soils - USDA - SCS, 1991

F:\215 - San Bruno\Figures\Figure 2.9 General Soil Classification.mxd, March 21, 2011

Figure 2.10
Estimated Recharge



Legend

Highways

Recharge (inches per year)

0 - 4

4 - 8

8 - 12

12 - 16

Plan Area

0 0.5 1 2 Miles

Source: Recharge - HydroFocus, 2011

F:\215 - San Bruno\Figures\Figure 2.10 Recharge.mxd, September 30, 2011

2.3.6 Early Development and Groundwater Usage

Early development in the South Westside Basin was primarily agricultural, with dairy cattle operations serving the nearby cities. Development of the type seen today began around the turn of the 20th century. Burials within the City of San Francisco were prohibited in 1900 and existing cemeteries were evicted in 1937. These events resulted in the establishment of the cemeteries in Colma. The 1906 earthquake resulted in the migration of people out of the damaged cities and into the undeveloped and newly developed areas in the South Westside Basin, particularly along the streetcar line that extended from San Francisco south through Daly City, San Bruno and beyond, as far as San Mateo by the late 1890s (Gillespie and Gillespie, 2009). San Francisco International Airport began operating in 1927, further driving urban growth. The most significant urban growth occurred during World War II as numerous industrial facilities operated out of South San Francisco, resulting in demand for area housing and commercial space. This growth continued until the area approached build-out. Historical population growth for the cities in the South Westside Basin (right axis), as well as for San Francisco (left axis), is shown in Figure 2.11.

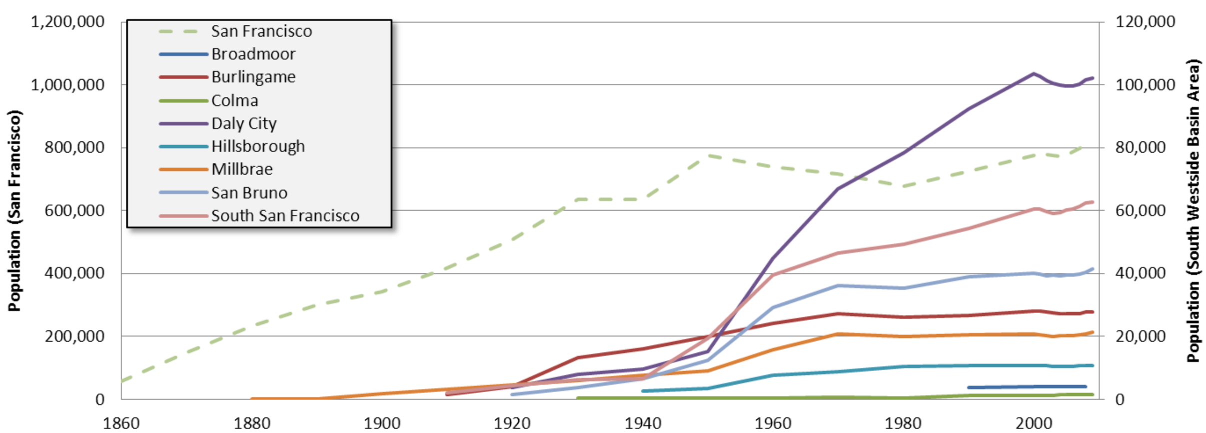


Figure 2.11. Historical Population Growth in the South Westside Basin

Historical groundwater use increased with development of the South Westside Basin through the 1960s. Beginning in the 1960s, groundwater use by municipal users began to decline (Figure 2.12), a result of conservation by customers as well as operational decisions as the water agencies have access to both groundwater and imported water through SFPUC's Hetch Hetchy system. Since the early 1960s, municipal groundwater use in the South Westside Basin has declined by approximately 25 percent, while imported water use has increased by approximately 40 percent.

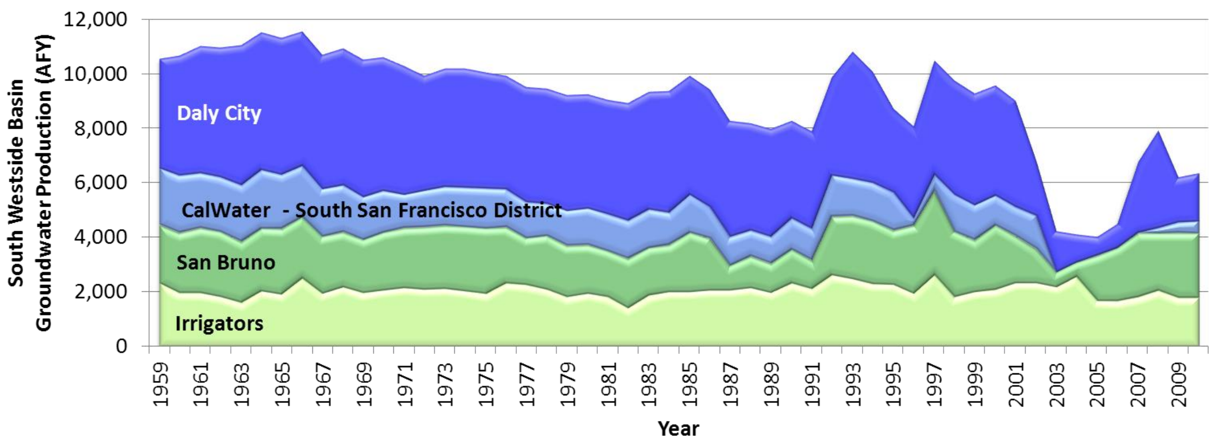


Figure 2.12. Historical Municipal Groundwater Production, South Westside Basin

2.3.7 GROUNDWATER LEVELS

There are little data on groundwater levels from the early development period of the South Westside Basin. Before groundwater production began, groundwater levels were likely close to the surface within the valley, draining to the Pacific Ocean in the west and to Colma Creek, San Francisco Bay, and other drainages to the east. A report from 1914 (Bartell, 1914) noted that San Bruno produced water from three artesian wells, which, when turned off, overflowed approximately 1 inch above the top of casing. Artesian flow was noted as being maintained through the previous two dry seasons. The same report noted pumping water levels in South San Francisco's nine wells of 55 to 60 ft below ground surface.

Through the early 1940s, groundwater levels remained above sea level in the Daly City area, although in the South San Francisco area groundwater levels were already 100 ft below sea level by that time (Kirker, Chapman & Associates, 1972). Groundwater levels remained relatively stable throughout the basin from the 1970s until the implementation of the ILPS in late 2002, which resulted in rising groundwater levels. Hydrographs present historical groundwater levels on Figures 2.13a-e (locations are presented on Figure 2.14). Current groundwater level conditions are shown in Figure 2.15.

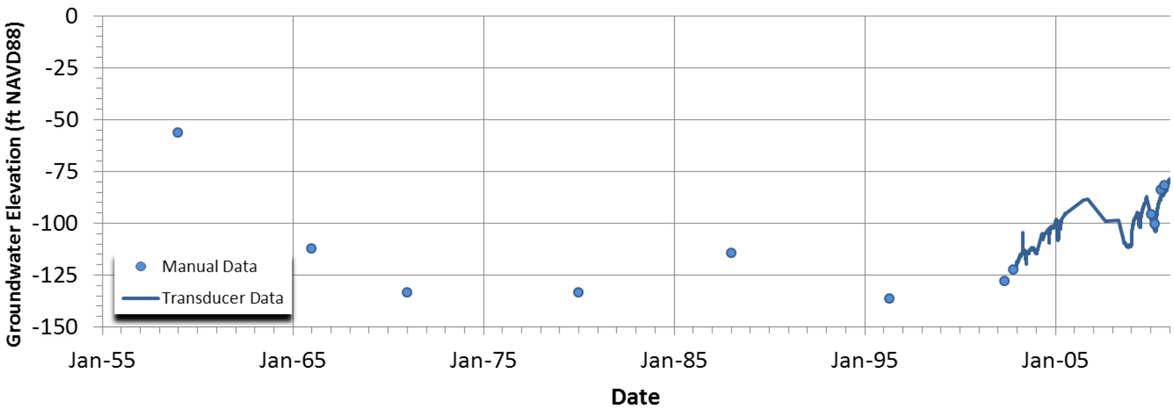


Figure 2.13a. Historical Groundwater Elevation, DC-8

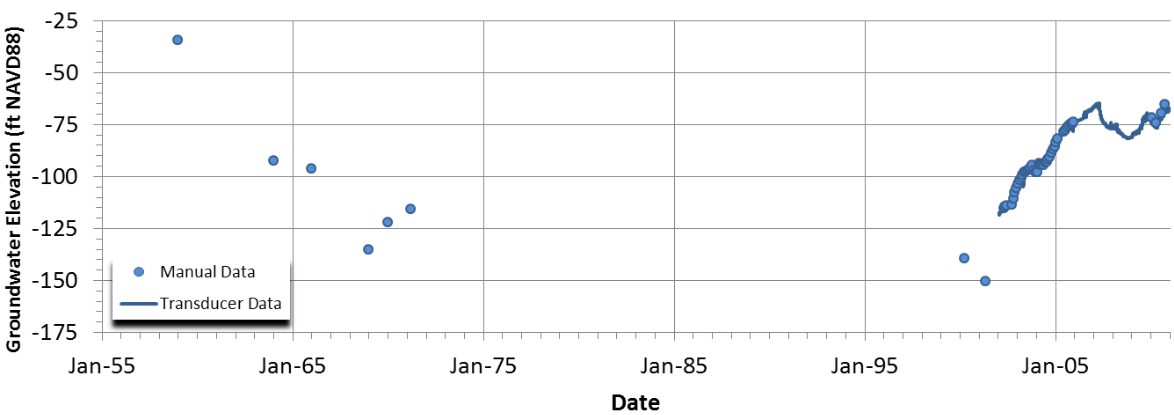


Figure 2.13b. Historical Groundwater Elevation, DC-1

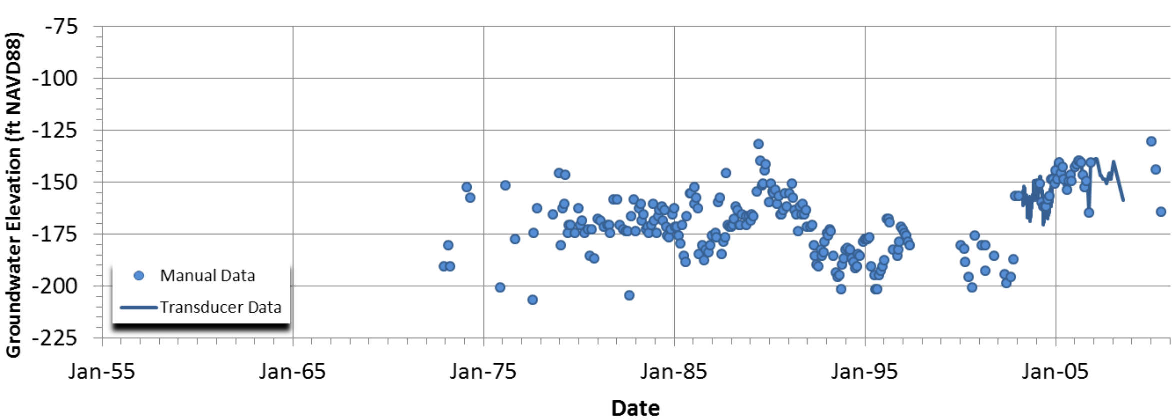


Figure 2.13c. Historical Groundwater Elevation, SS 1-20

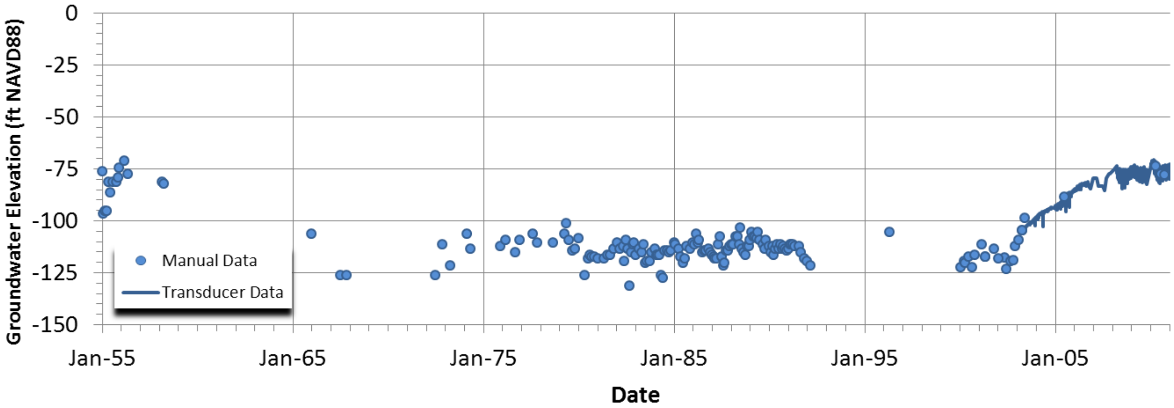


Figure 2.13d. Historical Groundwater Elevation, SS 1-02

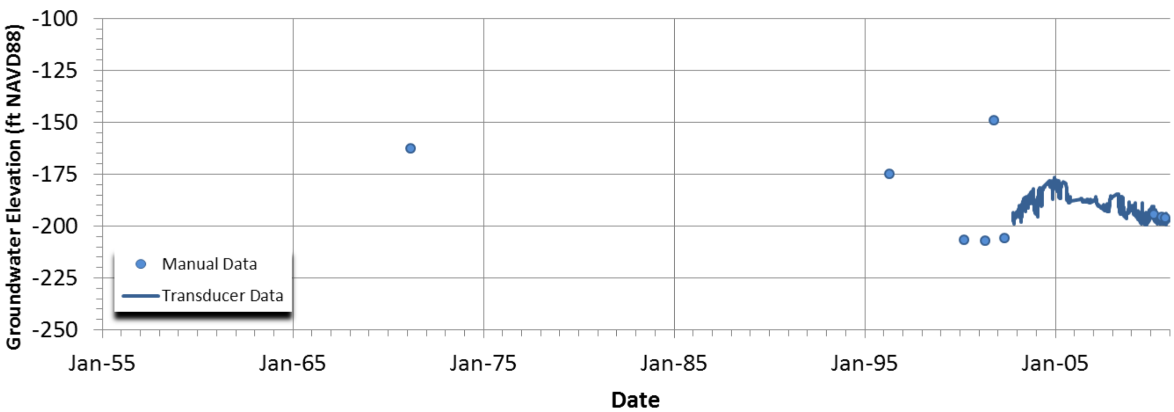


Figure 2.13e. Historical Groundwater Elevation, SB 12

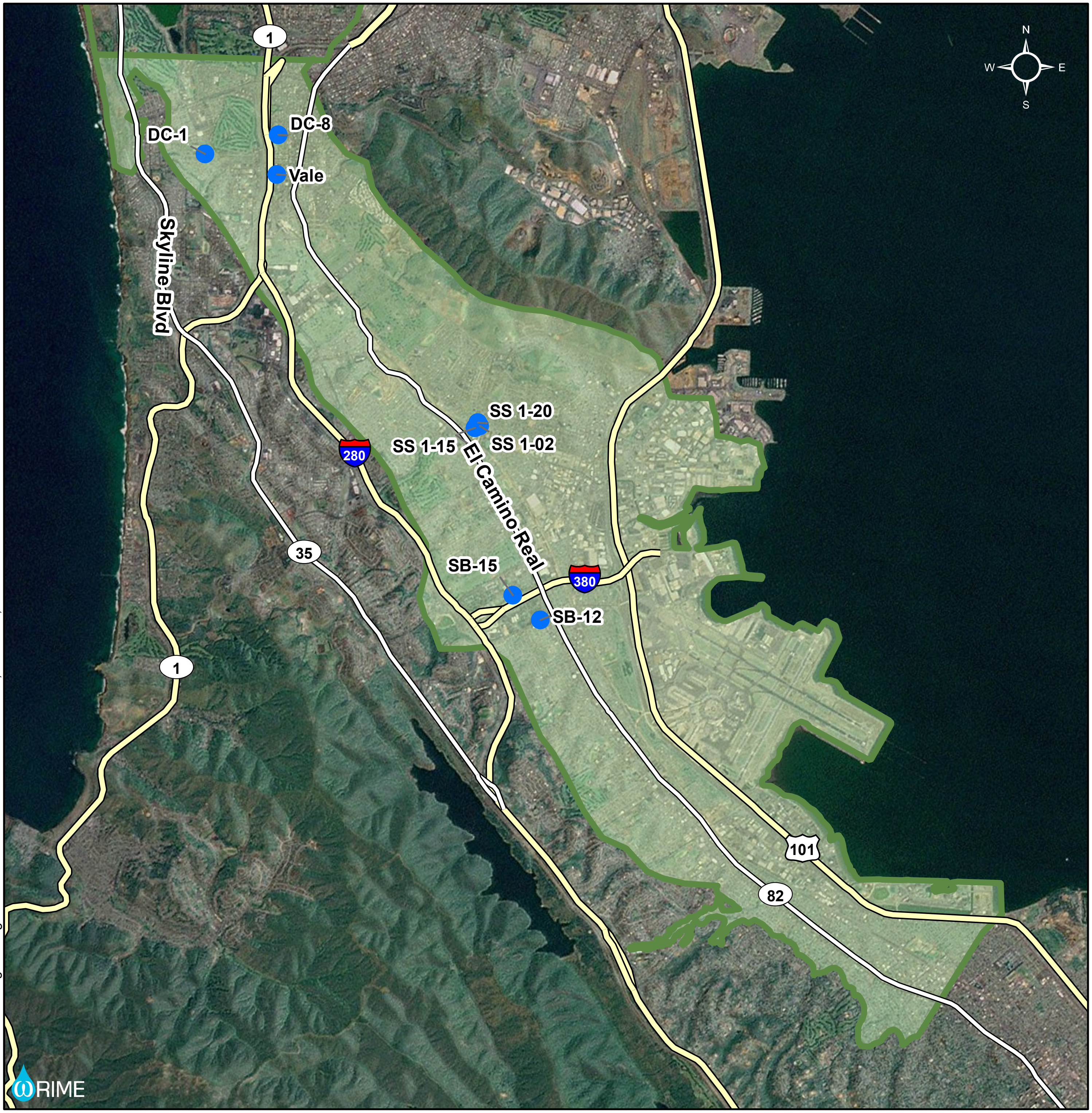


Figure 2.14
Location of Selected Wells

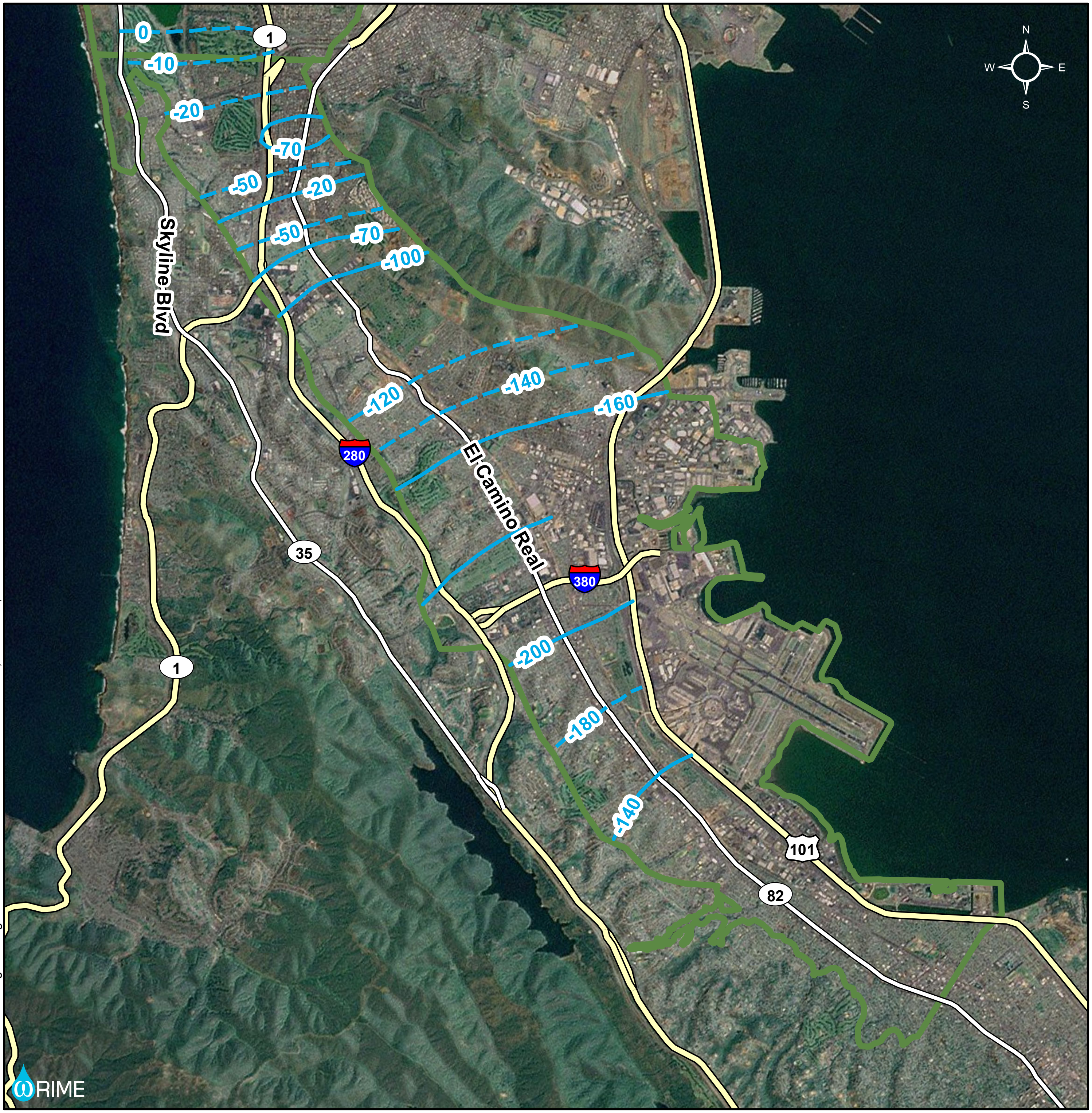
Legend

- Selected Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\215 - San Bruno\Figures\Figure 2.13 Location of Selected Wells.mxd, March 21, 2011

Figure 2.15
Groundwater Elevation Contours Primary Production Aquifer, Fall 2010



Legend

- Groundwater Elevation Contour (ft) (dashed where inferred)
- Highways
- Groundwater Basin

0 0.5 1 2 Miles

Source: Groundwater Levels: SFPUC, 2011

F:\215 - San Bruno\Figures\Figure 2.14 Groundwater Contours 2010.mxd, March 31, 2011

2.3.8 Groundwater Quality

Groundwater used for water supply in the South Westside Basin is generally good and delivered water meets all state and federal regulations. However, the quality of untreated groundwater in the basin is variable. Lower quality groundwater increases the cost of treatment for use as a drinking water source. Poor quality groundwater may not be economically, technically, or politically feasible for use as a water supply source.

2.3.8.1 Ambient Groundwater Quality

Ambient groundwater quality reflects the general groundwater quality on a regional scale. Most water quality data is available from existing municipal production wells, whose operators maintain a testing schedule to meet the requirements of the California Department of Public Health (DPH). Analysis of ambient water quality was performed based on raw groundwater quality data in a DPH database (2010).

Differences in the general chemistry of groundwater across the basin are shown through the Piper diagram on Figure 2.16. This diagram plots the relative concentrations of cations and anions. Similar waters will plot close to each other; different waters will plot farther apart. The close proximity of the plotted points shows the similarity of water across the South Westside Basin, however, there are noticeable differences between the water of the three agencies.

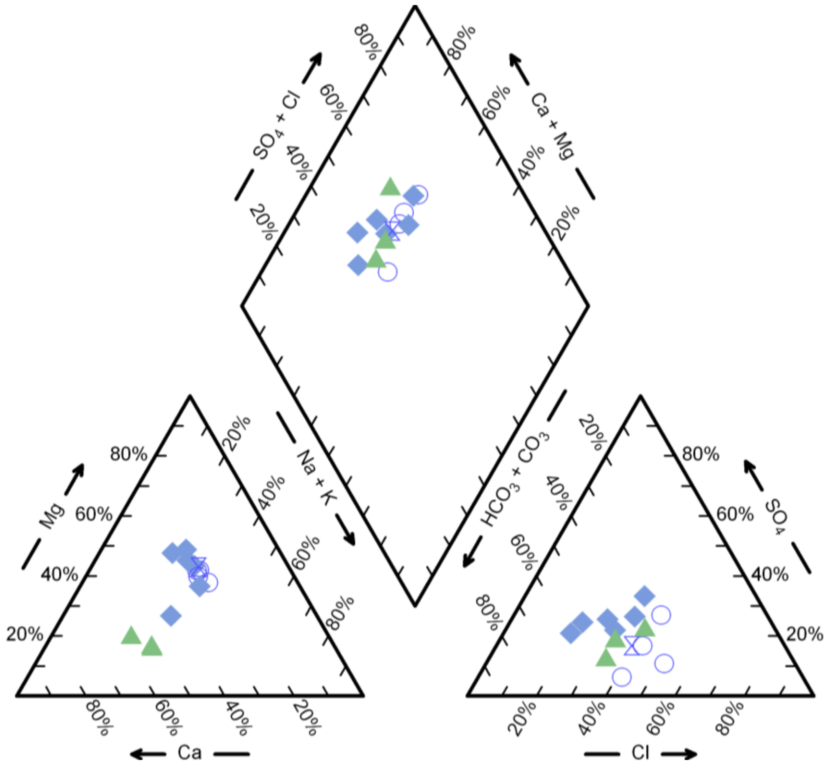


Figure 2.16. Piper Diagram of General Groundwater Chemistry for Wells Operated by Daly City (open blue), CalWater (filled blue), and San Bruno (filled green)

Analysis of the most prominent ambient water quality concerns, iron, manganese, nitrate, and total dissolved solids (TDS), was also performed based on raw groundwater quality data contained in the DPH database (2010). While these data are presented along with regulatory standards, it must be noted that a single detection of a contaminant may not indicate contamination. DPH would not consider a single detection of a contaminant, if unconfirmed with a follow-up detection, to be an actual finding. As another example, the presence of a contaminant in raw water does not necessarily mean that the water (and contaminant) was served by the water system to its customers, or, if served, that the contaminant was present at that concentration. Water systems may choose not use certain sources or may treat or blend them prior to service (DPH, 2010). While water containing higher concentrations of iron, manganese, nitrate, and TDS can be used following treatment, it is more economical to use water that does not require treatment.

Iron and manganese do not pose a risk to human health, but are an aesthetic concern for water users. High concentrations of iron and manganese can result in poor tasting water or water that stains fixtures. The source of iron and manganese in groundwater is typically naturally occurring soils and rocks containing iron and manganese. Secondary maximum contaminant levels (SMCL) are enforceable standards established by DPH based on consumer acceptance, rather than health risk. The SMCL is 300 micrograms per liter (µg/L) for iron and 50 µg/L for manganese. Figures 2.17 and 2.18 show the distribution of iron and manganese, respectively, over the Plan Area based on average 2005-2010 data from DPH. Generally, concentrations of iron and manganese are variable even within short distances. Figures 2.19a-c present historical trends in iron and manganese concentration for selected wells with locations shown in Figure 2.14. These figures show generally stable iron and manganese concentrations. The apparent increase in concentrations in the Vale Well is the result of higher detection limits for the later measurements and does not necessarily indicate increasing concentrations.

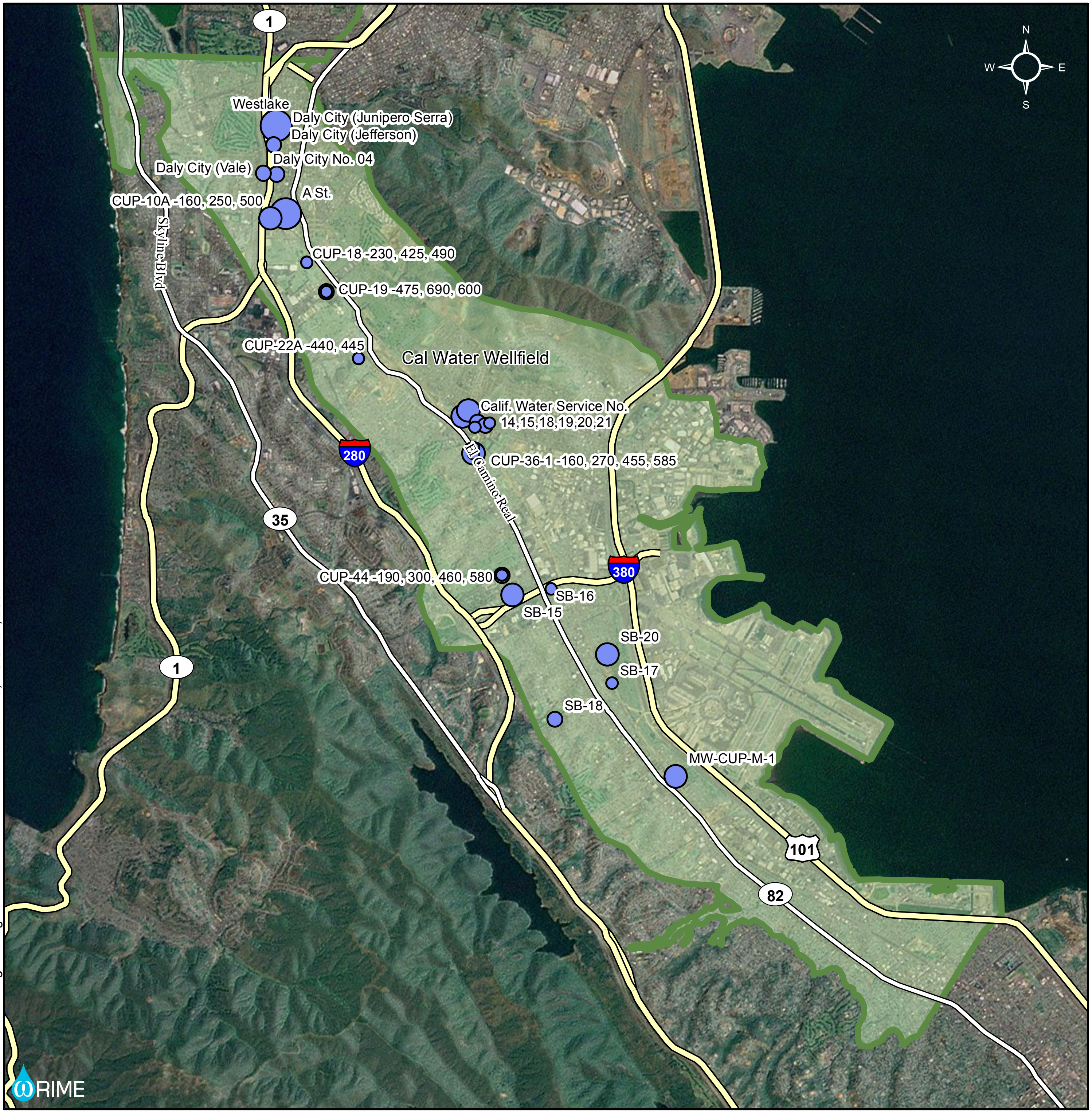


Figure 2.17
Iron Concentrations in Groundwater

Legend

Concentration (ug/L)

Iron (SMCL = 300)

- 0 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

City of San Bruno · California Water Service Co. · Daly City California

WRIME

F:\2.16 - San Bruno\Figures\Figure 2.16 Iron Concentrations.mxd.mxd, March 21, 2011

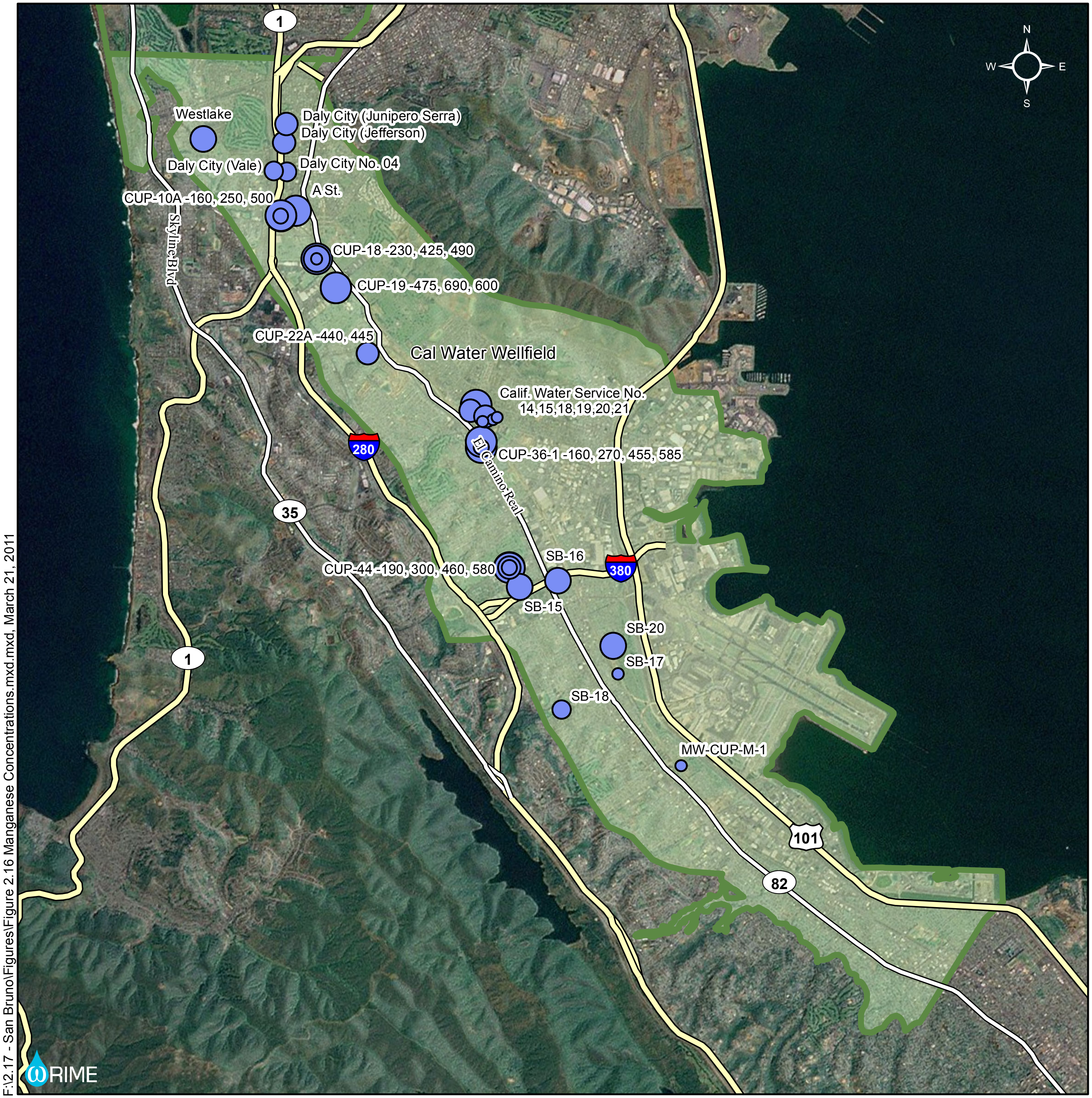


Figure 2.18
Manganese Concentrations in Groundwater

Legend

Concentration (ug/L)

Manganese (SMCL = 50)

- 1 - 5
- 5.01 - 10
- 10.01 - 20
- 20.01 - 50
- 50.01 - 100
- 100+

Highways

Groundwater Basin

Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

F:\2.17 - San Bruno\Figures\Figure 2.16 Manganese Concentrations.mxd.mxd, March 21, 2011

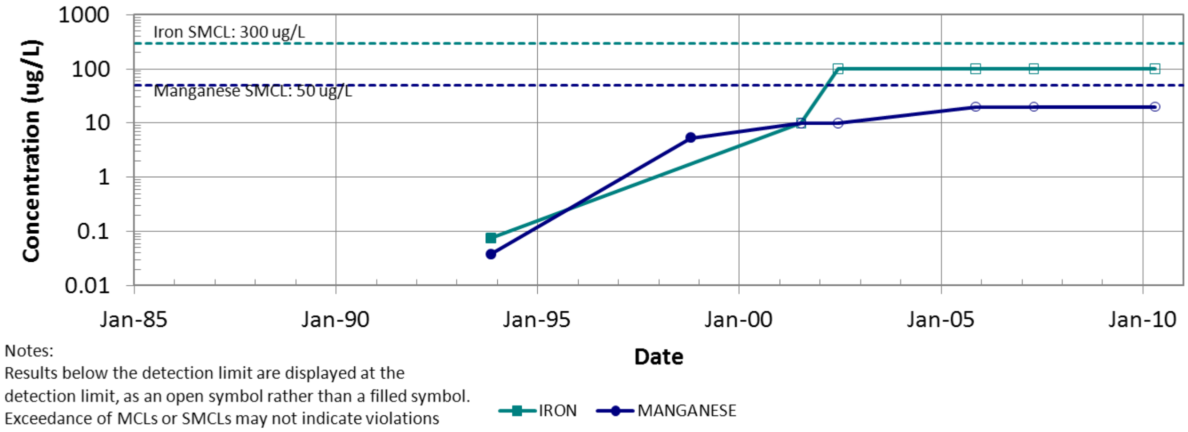


Figure 2.19a. Historical Iron and Manganese Concentrations, Vale Well

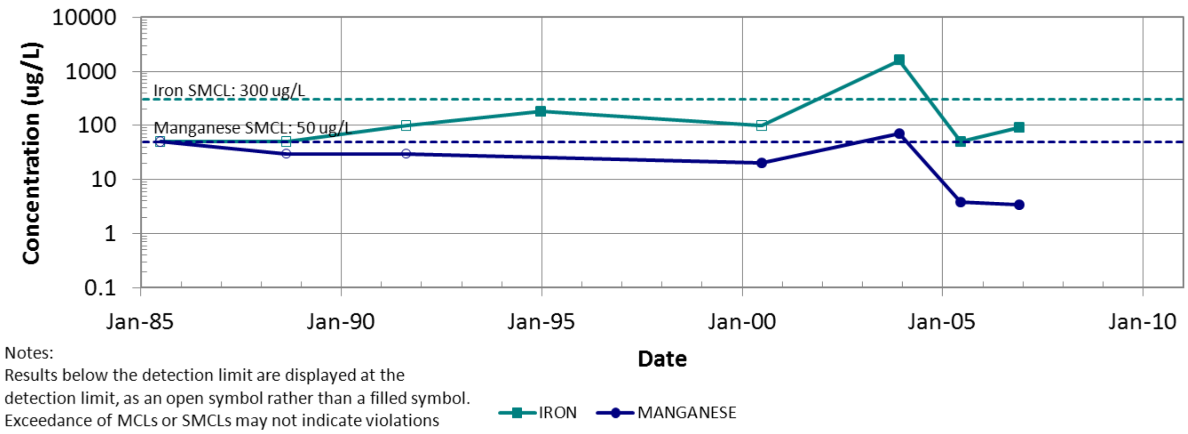


Figure 2.19b. Historical Iron and Manganese Concentrations, Well 01-15

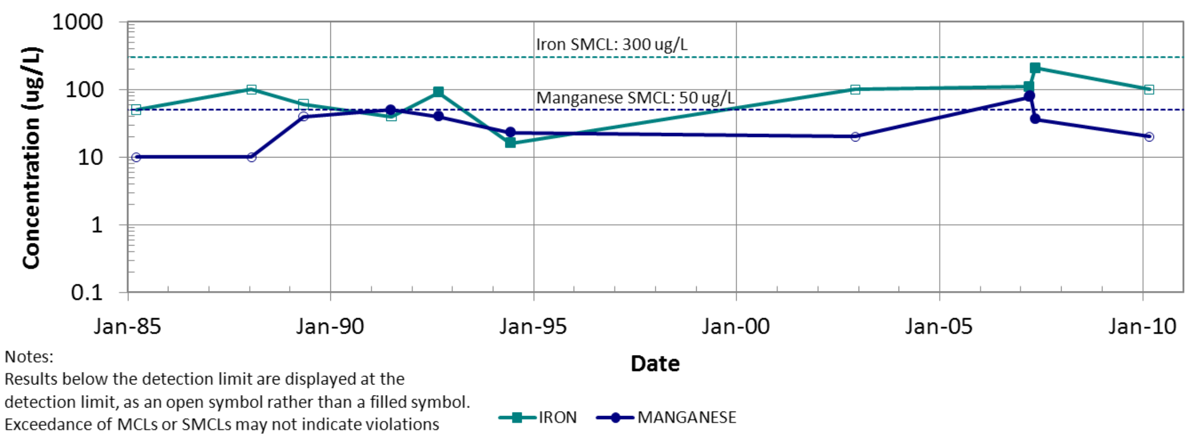


Figure 2.19c. Historical Iron and Manganese Concentrations, SB-15

Nitrate in groundwater poses a health risk if concentrations are too high and the water is not properly treated. Low levels of nitrate are naturally occurring, but higher levels are almost always the result of human activity, such as inorganic fertilizer, animal manure, septic systems, and deposition of airborne compounds from industry and automobiles. Maximum contaminant levels (MCL) are enforceable standards established by EPA and DPH to set the highest level of a contaminant allowed in drinking water. MCLs are set as close as feasible to the level below which there is no known or expected health risk using the best available treatment technology and taking cost into consideration (EPA, 2009). The MCL for nitrate is 45 milligrams per liter (mg/L) (as NO_3). Figure 2.20 shows the distribution of nitrate over the Plan Area based on average 2005-2010 data from DPH. Generally, nitrate concentrations are highest in the central portion of the Plan Area, South San Francisco, and lowest in the southern portion of the South Westside Basin, San Bruno. Some of this trend is due to the depth of the wells as the wells in South San Francisco are generally shallower than the other municipal wells in the basin and thus are more likely to show influences of contaminating activities at the surface. Figures 2.21a-c present historical trends in nitrate concentrations for selected wells with locations shown in Figure 2.14.

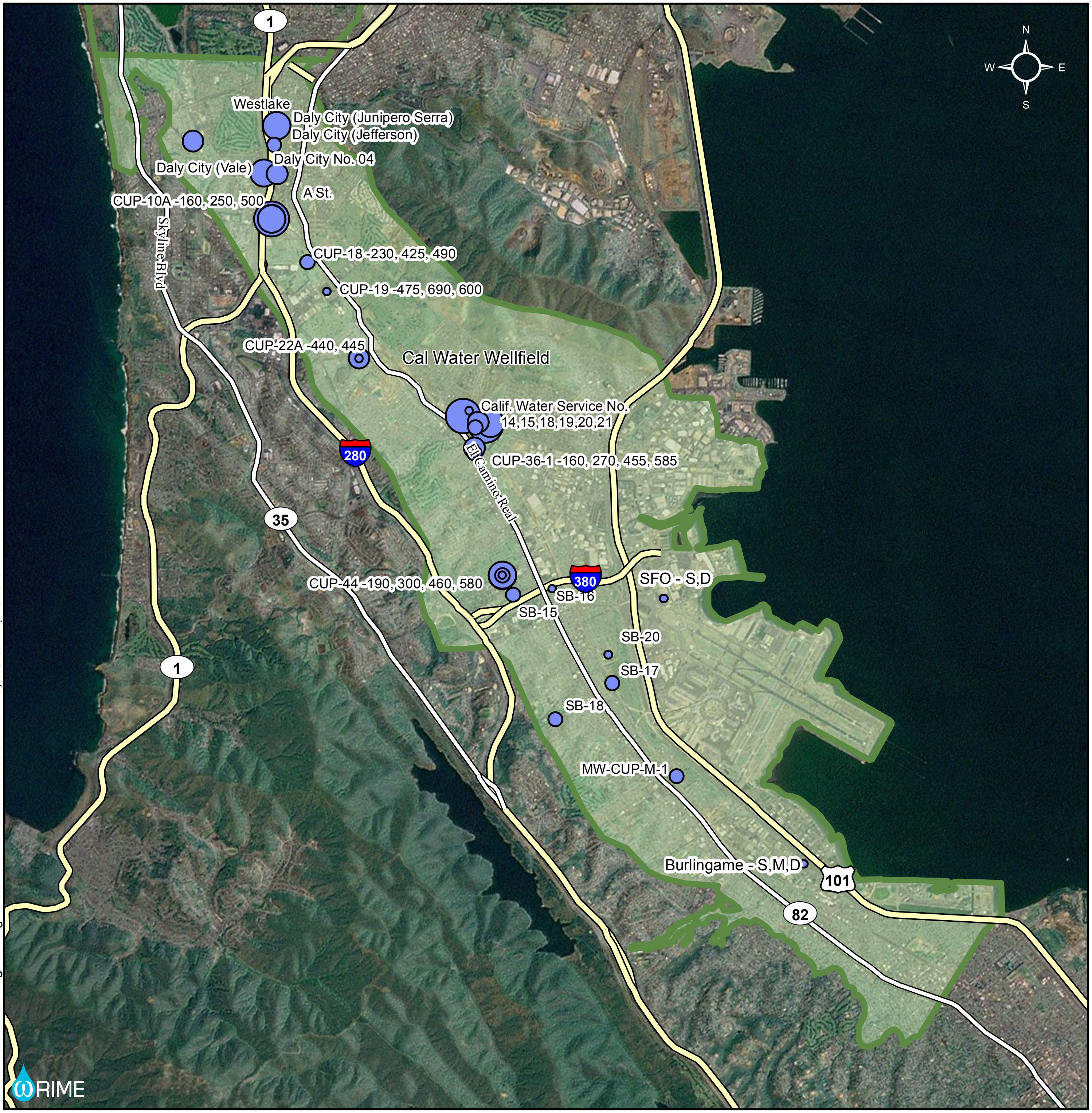


Figure 2.20

Nitrate as NO_3 Concentrations in Groundwater

Legend

Concentration (mg/L)

NO_3 (MCL = 45)

- 0.1 - 1.5
- 1.6 - 15
- 16 - 30
- 31 - 45
- 46 - 80
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

CITY OF SAN BRUNO · CALIFORNIA WATER SERVICE CO. · DALY CITY CALIFORNIA

F:\2.19 - San Bruno\Figures\Figure 2.16 No3 Concentrations.mxd.mxd, March 21, 2011

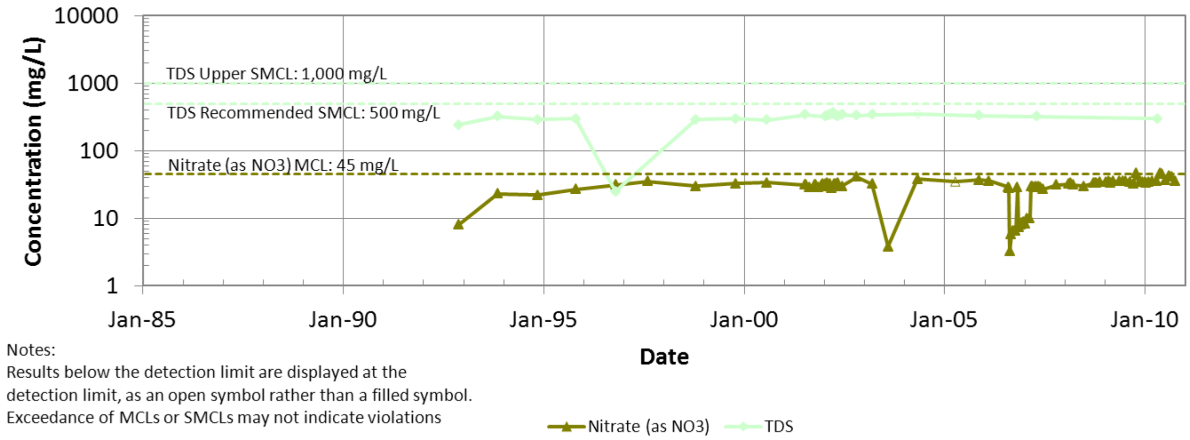


Figure 2.21a. Historical Nitrate and TDS Concentrations, Vale Well

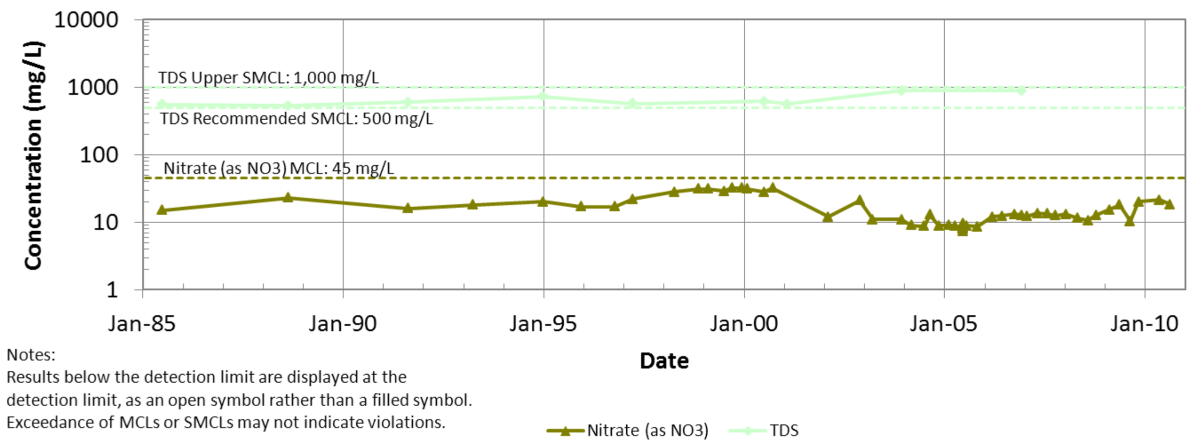


Figure 2.21b. Historical Nitrate and TDS Concentrations, Well 01-15

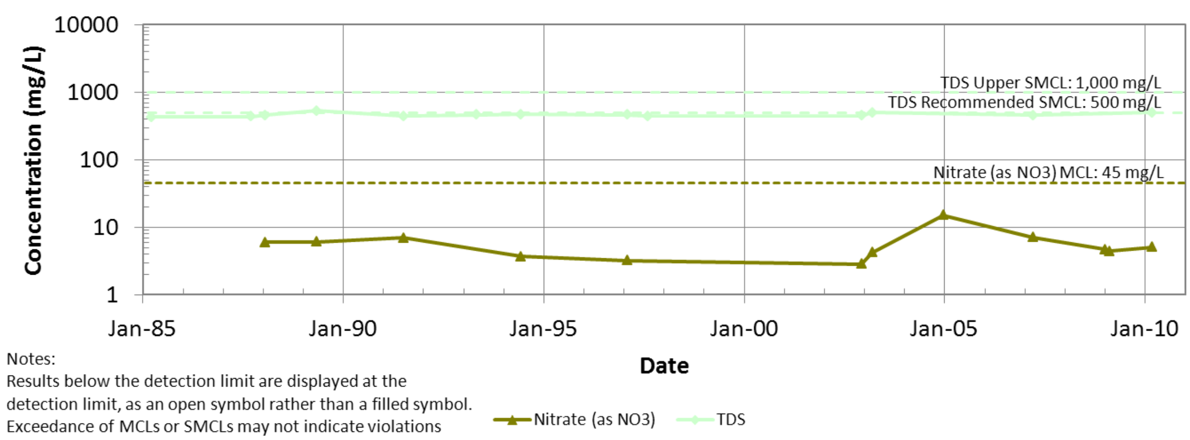


Figure 2.21c. Historical Nitrate and TDS Concentrations, SB-15

TDS do not pose a risk to health, but are an aesthetic concern for water users. High concentrations of TDS can cause scale buildup or hard water that is poor tasting. As TDS is a combined measurement of all dissolved compounds in the water, there are many naturally occurring sources as well as sources resulting from human activities. Irrigation often increases TDS as irrigation water collects salts that contribute to TDS as they percolate to the groundwater. This groundwater may be pumped back to the surface and used for irrigation again, further increasing TDS. Allowing water to leave the system or treating the water at the surface can break this cycle. Seawater intrusion can rapidly increase TDS in an aquifer. TDS has the following three SMCLs:

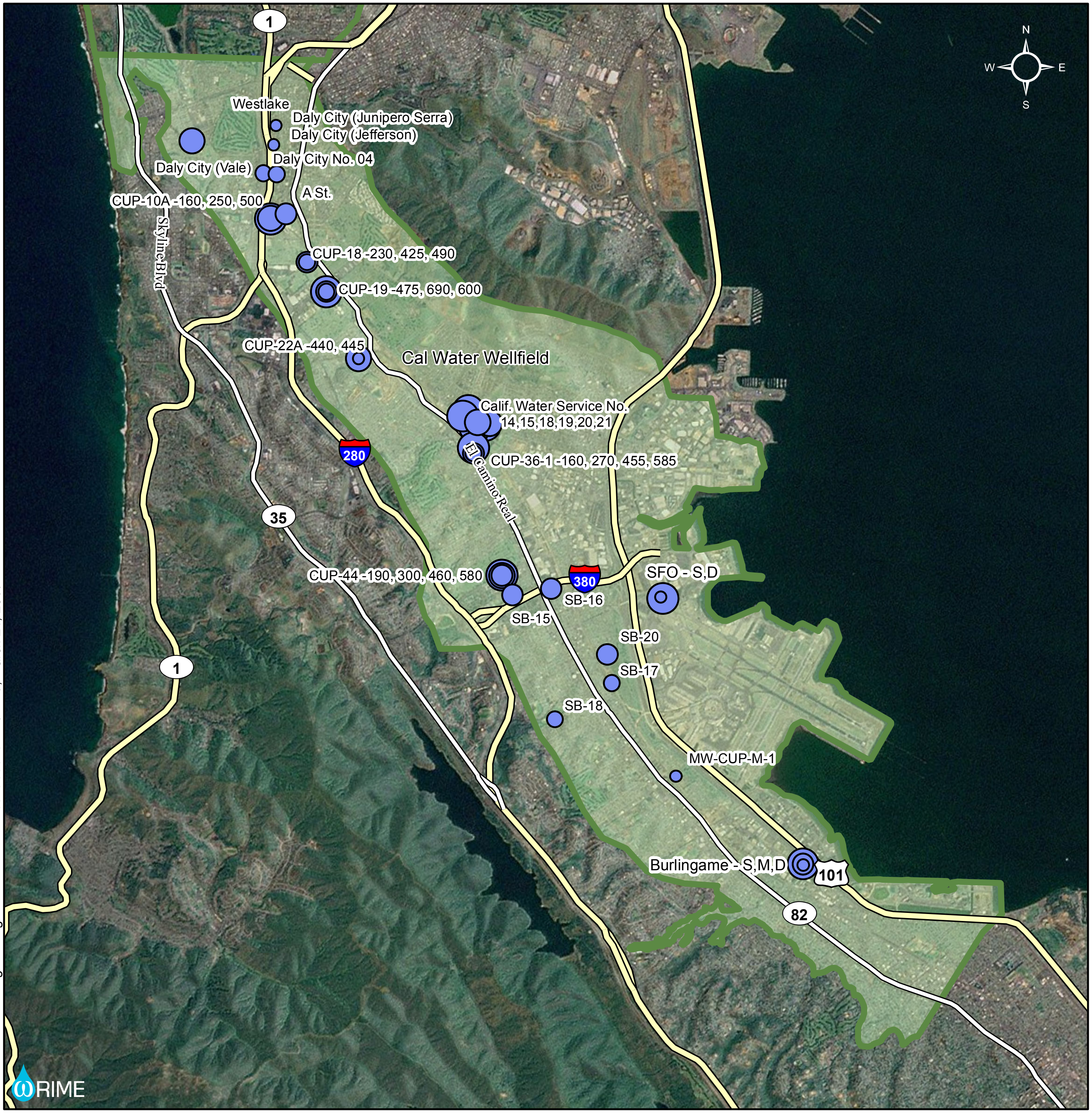
- Recommended: 500 mg/L. Constituent concentrations lower than the recommended contaminant level are desirable for a higher degree of consumer acceptance.
- Upper: 1000 mg/L. Constituent concentrations ranging to the upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable water.
- Short term: 1500 mg/L. Constituent concentrations ranging to the short term contaminant level are acceptable only for existing community water systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources. (DPH, 2009)

Figure 2.22 shows the distribution of TDS over the Plan Area based on average 2005-2010 data from DPH. Generally, TDS concentrations are highest in the central portion of the Plan Area, South San Francisco, and lowest in the northern portion of the South Westside Basin, Daly City. Some of this trend is due to the depth of the wells as the wells in South San Francisco are generally shallower than the other municipal wells in the basin and thus are more likely to show influences of contaminating activities at the surface. Figure 2.21a-c presents historical trends in TDS concentrations for selected wells with locations presented on Figure 2.14.

2.3.8.2 Point Source Contamination

In addition to ambient water quality concerns, contaminated groundwater from point sources can quickly remove wells from service and thus requires close coordination with regulatory agencies such as EPA, RWQCB, the California Department of Toxic Substances Control (DTSC), and local oversight programs, including San Mateo County Groundwater Protection Program. Based on a search of DTSC's Envirostor database and the Water Board's GeoTracker database, the sites summarized on Table 2.4 have been identified as federal, state, or voluntary cleanup sites potentially affecting the aquifer used for drinking water supply.

Figure 2.22
TDS Concentrations in Groundwater



Legend

Concentration (mg/L)

TDS (SMCL = 500/1000/1500)

- 250 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 600 +
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

F:\2.19 - San Bruno\Figures\Figure 2.21 TDS Concentrations.mxd.mxd, March 21, 2011

Table 2.4
Open Contaminated Sites Potentially Impacting the Aquifer Used for Drinking Water Supply

Name	Address	ID	Potential Contaminants of Concern	Lead Agency
ARCO #0465	151 Southgate Avenue, Daly City	T0608100027	Benzene, Toluene, Xylene, Fuel Oxygenates, Gasoline	County of San Mateo Health Services Agency
Chevron 9-6982	892 John Daly Blvd, Daly City	T0608100148	Gasoline	County of San Mateo Health Services Agency
Agbayani Construction	88 Dixon Ct., Daly City	T10000002674	Tetrachloroethylene (PCE), Trichloroethylene (TCE), Vinyl chloride	County of San Mateo Health Services Agency
Gas & Wash Partners	247 87th St., Daly City	T10000003031	Benzene, Toluene, Xylene, Gasoline	County of San Mateo Health Services Agency
United Airlines Maintenance Center	San Francisco International Airport, South San Francisco	SL0608106162	Solvents	RWQCB
Chevron 9-5584, former	1770 El Camino Real, San Bruno	T0608179897	Gasoline	County of San Mateo Health Services Agency
1245 Montgomery Ave	1245 Montgomery Ave., San Bruno	SL0608187730	Benzene, Other Solvent or Non-Petroleum Hydrocarbon, TCE	RWQCB

As with all urban areas in the state, numerous Leaking Underground Fuel Tanks and Spills Leaks Investigation and Cleanup sites are present in the South Westside Basin and are being monitored and/or remediated under the regulatory lead of the RWQCB or the local oversight program. Leaking underground fuel tanks are typically at gas stations, while spills leaks investigation and cleanup sites have a variety of sources, but all involve hazardous wastes that have impacted soil and/or groundwater.

Many, but not all, of these point-source contaminants occur at the surface and tend to remain near the surface due to the chemical properties of the contaminants and the geologic conditions that slow the migration of these contaminants into the deep aquifer used by municipal groundwater producers in the basin and most private producers. Detailed coordination is required to ensure that corrective action on point sources is sufficient to protect groundwater quality. A map of known, active contaminated sites that have affected or could potentially affect groundwater, soils, or other environmental media is shown in Figure 2.23, as detailed by the Water Board's GeoTracker database system. Sites on Figure 2.23 are classified as follows:

- **Drinking Water Aquifer:** Sites listed on GeoTracker as Potentially Affecting Aquifer Used for Drinking Water Supply or Potentially Affecting Well Used for Drinking Water Supply
- **Shallow Groundwater:** Sites listed on GeoTracker as Potentially Affecting Other Groundwater (Uses Other Than Drinking Water)
- **Other Impact:** Sites listed on GeoTracker as Potentially Affecting Indoor Air, Sediments, Soils, Soil Vapor, Surface Water, or Under Investigation

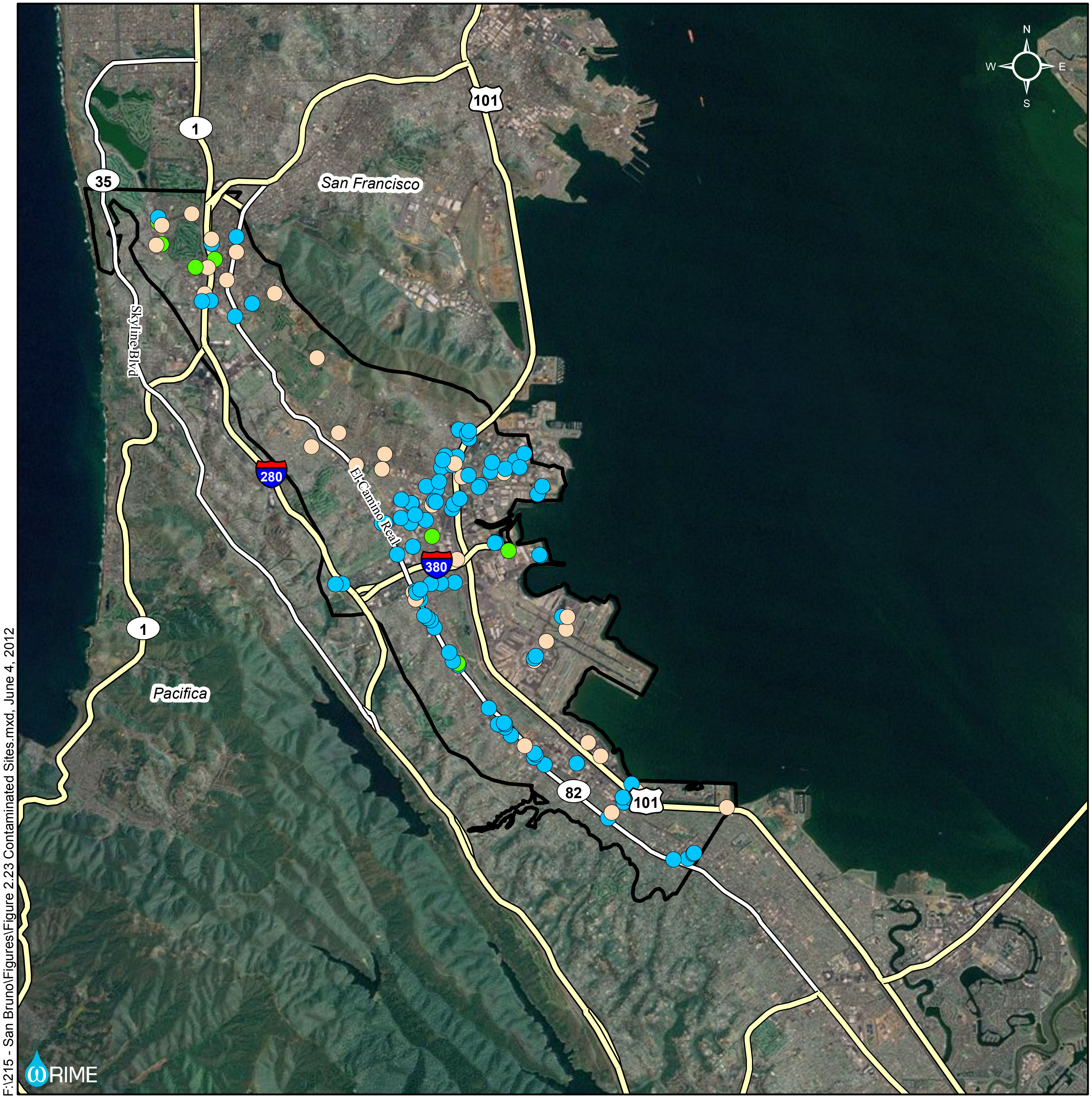
Note that, in the South Westside Basin, only the United Airlines Maintenance Facility is listed as Potentially Affecting Well Used for Drinking Water Supply, and this site, like many others, is extensively monitored and actively undergoing remediation activities.

Groundwater here includes shallow, perched groundwater not directly used for water supply (Other Groundwater). The distinction between shallow, perched groundwater not directly used for water supply and groundwater used for drinking water supply is to some degree based on professional judgment by the preparers of the GeoTracker system; Section 5.4.3 contains recommendations for coordination with regulatory agencies to improve the accuracy and usefulness of these classifications for regional planning and public outreach.

2.3.9 Desalter Infrastructure

There is currently no desalination infrastructure in the South Westside Basin.

Figure 2.23
Contaminated Sites



Legend

Contaminated Sites by Potential Impact

- Drinking Water Aquifer
- Shallow Groundwater
- Other Impact
- Highways
- Plan Area

0 0.5 1 2 Miles

Source: Water Board, 2010

2.3.10 Groundwater/Surface Water Interaction

Interaction between groundwater and surface water in the Plan Area is limited due to the significant depth to groundwater used for water supply, numerous clay layers that slow vertical migration of water through the subsurface, and the presence of only minor surface water features, such as Colma Creek, which are often channelized. The perched water table above the upper clay units interacts with local surface water courses, such as Colma Creek and smaller creeks. Groundwater tends to seep into the surface water courses near the Bay and the surface water recharges the groundwater at higher elevations. The perched aquifer, which is not used as a water supply, slowly recharges the deeper aquifer through the clay layers.

Lake Merced is an important surface water feature just north of the Plan Area. The draft North Westside Basin GWMP addresses issues with groundwater interaction with Lake Merced.

2.3.11 Subsidence and Liquefaction

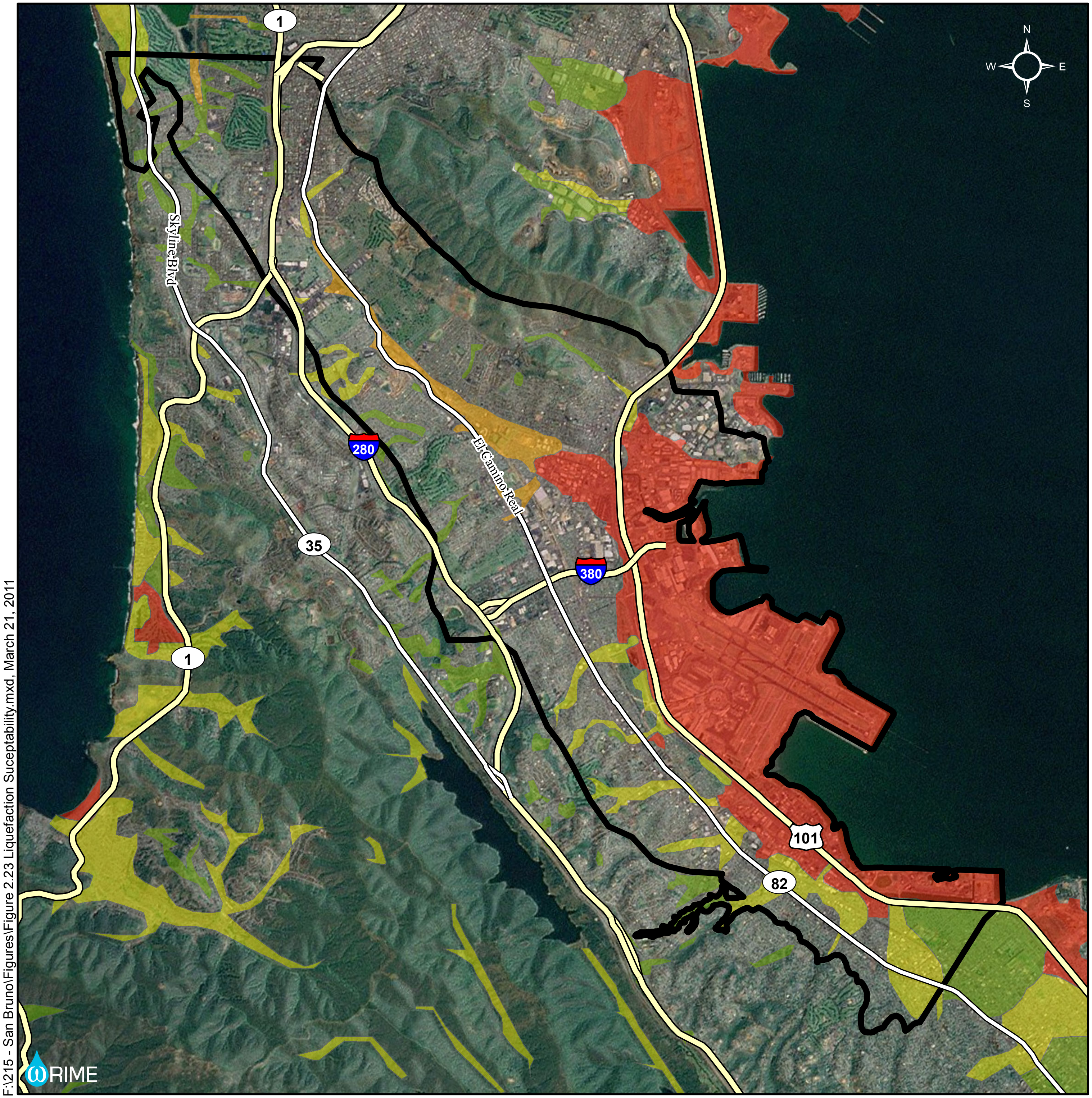
Subsidence and liquefaction are both influenced by changes in groundwater levels. Low groundwater levels can contribute to subsidence while high groundwater levels can contribute to liquefaction.

Land subsidence here refers to the lowering of the ground surface as a result of groundwater level changes, not tectonic changes. Aquifers, particularly the fine-grained materials within or between the aquifers, are compressible. If groundwater levels decrease as a result of pumping or other causes, water may be released from beds of clay or silt around the coarser materials that are the primary source of water in the aquifer. The release of water from the beds of clay and silt reduces the water pressure, resulting in a loss of support for the clay and silt beds. Because these beds are compressible, they compact (become thinner), and the effects are seen as a lowering of the land surface (Leake, 2004). Whether or not subsidence through compression occurs in an area depends on groundwater levels (groundwater levels must decline) and on materials (sufficient compressible clays and silts must be present).

There are no available records of historical subsidence in the South Westside Basin. Significant studies have been performed to the south in the Santa Clara Valley, due to extensive subsidence in that area. Those studies show that the extent of subsidence in the area is focused on Santa Clara, where land subsided 8 ft from 1934 to 1967. To the north, subsidence is more limited, with less than 1 foot of subsidence in the Palo Alto area and approximately an inch of subsidence in the Redwood City area (Poland and Ireland, 1988). Studies have not been performed farther north, likely due to a lack of evidence of active subsidence.

The Plan Area has potential for liquefaction, where earthquake-induced shaking can cause a loss of soil strength, resulting in the inability of soils to support structures. This can occur in saturated soils where the shaking causes an increase in water pressure to the point where the soil particles can move easily within the soil-water matrix. Areas along San Francisco Bay have been rated as having "very high" susceptibility to liquefaction by the USGS (Figure 2.24; Witter et al., 2006). These areas are underlain by artificial fill over Bay Mud. While only covering the bayshore area, artificial fill over Bay Mud accounted for 50 percent of all historical liquefaction occurrences in the nine-county San Francisco Bay area and about 80 percent of those liquefaction occurrences resulted from the Loma Prieta earthquake (Witter et al., 2006). In the South Westside Basin, these units have a perched water table that is not influenced by groundwater production. Areas with high to moderate susceptibility to liquefaction include areas along current or former creeks, particularly Colma Creek. Other areas have low or very low susceptibility to liquefaction.

Figure 2.24
Liquefaction Suceptability



Legend

- Highways
- Plan Area

Liquefaction

- Very High
- High
- Moderate
- Low

0 0.5 1 2 Miles

Sources:
• Liquefaction Susceptability - Witten et al, 2006

F:\215 - San Bruno\Figures\Figure 2.23 Liquefaction Suceptability.mxd, March 21, 2011

2.3.12 GROUNDWATER MONITORING

Current South Westside Basin-wide groundwater monitoring is coordinated through the agencies throughout the Plan Area and is presented in annual groundwater monitoring reports prepared by SFPUC since 2005. The reports include details on semi-annual monitoring of groundwater production, level, and quality data as well as data on Lake Merced water levels. Prior to that date, San Mateo County maintained a semiannual groundwater monitoring program that included static water level and water quality monitoring. San Mateo County's reports covered the period from 2000 through 2003. The individual agencies also maintain long-term records of production, water levels, and water quality for their facilities.

2.3.12.1 Groundwater Level Monitoring

Groundwater level monitoring for use in the regional annual groundwater reports includes both dedicated monitoring wells and inactive production wells. Dedicated monitoring wells include wells installed as part of seawater intrusion monitoring, groundwater/surface water interaction monitoring, and as part of the GSR. Measurements are taken manually on a quarterly or semiannual basis in some wells, and daily through the use of electronic pressure transducers in other wells (SFPUC, 2010a). Monitoring wells measured in the South Westside Basin include the following:

- Daly City Area
    - LMMW-6D
    - Thornton Beach MW 225, 360, 670
    - DC-1 (Westlake 1)
    - Park Plaza MW460, 620
    - DC-8
    - CUP 10A MW160, 250, 500, 710
- Colma Area
    - CUP 18 MW230, 425, 490, 660
    - CUP 19 MW180, 475, 600, 690
    - CUP 23 MW230, 440, 515, 600
- South San Francisco Area
    - CUP 22A MW140, 290, 440, 545
    - SS 1-02
    - SS 1-20
    - CUP 36 MW160, 270, 455, 585
    - SSFLP MW120, 220, 440, 520
- San Bruno Area
    - CUP 44-1 MW190, 300, 460, 580
    - SB-12 (Elm Ave)

    - UAL-13C, 13D
    - SFO-S, -D
- Millbrae Area
    - CUP-M-1
- Burlingame Area
    - Burlingame-S, -M, -D

Additionally, groundwater levels are also monitored by the individual agencies, and include measurements of static or dynamic water levels, depending on the operational status of the well.

2.3.12.2 Groundwater Production Monitoring

Groundwater production data are summarized for the water agencies and for metered users of recycled water in SFPUC's annual reports. Other irrigation production is estimated and also presented in the report.

2.3.12.3 Groundwater Quality Monitoring

Groundwater quality is monitored for both regional analysis in SFPUC annual reports and to meet the DPH's requirements specified in Title 22 of the California Code of Regulations.

Individual agencies test the water quality in the active municipal productions wells on a schedule to meet DPH requirements and to ensure safe drinking water for their customers.

Water quality data are collected for use in SFPUC's annual reports, either specifically for the program or as part of the testing for DPH requirements or other programs such as seawater intrusion monitoring or monitoring for use in the proposed GSR.

2.4 IMPORTED WATER

Imported water in the South Westside Basin is supplied by SFPUC, which operates the Hetch Hetchy system. Details of the system are provided in the following two paragraphs, based on SFPUC's *Annual Water Quality Report* (SFPUC, 2010b). The *Annual Water Quality Report* is included in Appendix B and contains more detailed information on chemical constituents in the water supply.

The major sources of imported water are from the SFPUC and include Hetch Hetchy Reservoir and the local watersheds. Hetch Hetchy is located in the well-protected Sierra region and meets all federal and state criteria for watershed protection. Based on SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the state has granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that SFPUC is not required to filter water from Hetch Hetchy Reservoir.

Hetch Hetchy Reservoir water is provided by SFPUC to Daly City, San Bruno, Millbrae, Burlingame, and to the Golden Gate National Cemetery. SFPUC provides water to CalWater from sources in accordance with the Raker Act.

Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff collected from the Alameda Watershed, which spans more than 35,000 acres in Alameda and Santa Clara Counties, are collected in the Calaveras and San Antonio reservoirs. Prior to distribution, the water from these reservoirs is treated at the Sunol Valley Water Treatment Plant. Treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. Fluoridation, chloramination, and corrosion control treatment are provided for the combined Hetch Hetchy and Sunol Valley Water Treatment Plant water at the Sunol Chloramination and Fluoridation Facilities. Rainfall and runoff captured in the 23,000-acre Peninsula Watershed in San Mateo County are stored in reservoirs, including Crystal Springs (Lower and Upper), San Andreas, and Pilarcitos. The water from these reservoirs is treated at Harry Tracy Water Treatment Plant, where treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination.

Daly City has 10 SFPUC pipeline connections called turnouts. They are connected to the Sunset, San Andreas #2, and Crystal Springs #2 pipelines and can supply approximately 30.89 mgd at a rate of approximately 21,400 gallons per minute (Daly City, 2005).

CalWater - South San Francisco District receives water from 12 connections at 11 SFPUC turnouts and groundwater from eight wells. Portions of CalWater's distribution system rely solely on SFPUC imported surface water, while others use groundwater from CalWater's wellfield for all or a portion of their water supply (MWH, 2007).

San Bruno has four connections to SFPUC's water supply system and one connection to North Coast County Water District (NCCWD). During normal conditions, water from SFPUC is transported through the San Andreas Pipeline from the Harry Tracy Water Treatment Plant near Crystal Springs Reservoir and delivered to three of San Bruno's turnouts. San Bruno also has a connection to SFPUC's 60-inch diameter Sunset Supply Pipeline, which was recently fitted with a pressure reducing valve, and is currently used only for fireflow and other emergency situations. The Sunset Supply Pipeline can deliver water directly from SFPUC's Hetch Hetchy System. San Bruno's connection from the NCCWD extends from SFPUC's Harry Tracy Water Treatment Plant to Crystal Springs Terrace. San Bruno purchases treated water from the NCCWD to serve the Crystal Springs Terrace area. This connection is equipped with a pressure reducing valve at Regulating Station 1 (EKI, 2007; Brown and Caldwell, 2001).

Millbrae receives water from five SFPUC turnouts. The Harry Tracy Water Treatment Plant supplies filtered water in the higher elevations, while the Crystal Springs #2 and #3 pipelines deliver water to the lower elevations (BAWSCA, 2009).

Burlingame receives water from six metered turnouts connected to SFPUC's Sunset Supply Pipeline and Crystal Springs Pipelines #2 and #3 (EKI, 2005).

2.5 RECYCLED WATER

Wastewater collection, treatment, and disposal performed by the local agencies is described in the following sections. Of these agencies, the North San Mateo County Sanitation District also includes treatment and distribution of recycled water as part of its wastewater activities.

2.5.1 TREATMENT PLANTS

Wastewater treatment plants in the South Westside Basin include:

- North San Mateo County Sanitation District's (NSMCSD) treatment plant, which includes a recycled water facility permitted to distribute 2.77 mgd of tertiary recycled water.
- San Bruno and South San Francisco's South San Francisco/San Bruno Water Quality Control Plant
- Burlingame's Wastewater Treatment Facility
- City of Millbrae's Water Pollution Control Plant

2.5.1.1 North San Mateo County Sanitation District Treatment Plant

The NSMCSD is a subsidiary of the City of Daly City and owns and operates a treatment plant at the southern end of Westlake Park in Daly City. The plant was expanded in 1989 to a capacity of 10.3 mgd. The NSMCSD provides collection, treatment and disposal for the majority of the residents of Daly City, along with Broadmoor Village, a portion of Colma, the Westborough County Water District in South San Francisco, and the San Francisco County Jail in San Bruno (Daly City, 2009).

In 2003, NSMCSD constructed facilities at its wastewater treatment plant to produce recycled water. The plant has the capacity and permits for production of approximately 2.77 mgd of tertiary-treated recycled water (SFPUC, 2008) and began delivery in 2004 to irrigation users.

2.5.1.2 South San Francisco/San Bruno Water Quality Control Plant

The South San Francisco/San Bruno Water Quality Control Plant was constructed in the early 1970s and is jointly operated by the cities of South San Francisco and San Bruno. The sewage of both cities is treated, as is wastewater from a portion of Colma and the Serramonte portion of Daly City. The Westborough Water District coordinates sewage treatment for the Westborough portion of South San Francisco under contract with Daly City.

The current design capacity of the treatment plant is 13 mgd with an actual capacity of 9 mgd average dry weather flow. A plant expansion, begun in the fall of 1998, increased the dry-weather operational capacity to 13 mgd. The expansion added three new primary clarifiers, additional secondary clarifiers, and removed obsolete equipment (South San Francisco, 2009).

2.5.1.3 City of Millbrae Water Pollution Control Plant

The City of Millbrae provides wastewater service to approximately 5,928 residential and 495 commercial customers. The City's Sanitation System has two components: collection and treatment/disposal. Wastewater is collected via a network of about 57 miles of sewer pipelines and two wastewater pumping stations, and then transported to the City's Water Pollution Control Plant for treatment and disposal (Millbrae, 2009a). In October 2009, Millbrae began a refurbishment of the Water Pollution Control Plant to improve treatment capabilities and minimize sanitary sewer overflows that can occur during stormy weather. This project will add a 1.2 million gallon flow equalization tank to retain the extra water that flows into the treatment plant during storms (Millbrae, 2009b).

2.5.1.4 Burlingame Wastewater Treatment Facility

The wastewater treatment facility at 1103 Airport Boulevard became operational during 1935-36. The facility has a designed capacity to treat 5.5 mgd of wastewater and 16 mgd during wet weather (Burlingame, 2009).

2.5.2 RECYCLED WATER INFRASTRUCTURE AND USERS

Existing recycled water infrastructure and users are in the Daly City / Lake Merced area. Recycled water for non-potable (non-drinkable) uses such as irrigation is encouraged to conserve drinking water supplies. Installation of recycled water pipelines in the NSMCSD began in the mid-1980s when water or sewer projects were constructed. As discussed in Section 2.5.1.1, NSMCSD's treatment plant has the capacity and permits for production of 2.77 mgd of recycled water.

Today, the system is used to irrigate landscaped medians in the Westlake area and golf courses at Olympic Club, Lake Merced Golf Club, and San Francisco Golf Club. These customers use an average of less than 1 mgd of recycled water. Construction is underway to expand the recycled water infrastructure and user base to include irrigation of Harding Park and Fleming golf courses.

Plainly marked purple pipelines, completely separate from drinking water systems, deliver the water to user sites. Water recycling is a safe and proven practice. For many years, recycled water has been safely used for landscape irrigation purposes throughout California and the world saving precious potable water for other uses (Daly City, 2009).

Studies have been performed to investigate recycled water opportunities based on production at the South San Francisco/San Bruno Water Quality Control Plant (Carollo, 2008, 2009). These documents analyzed irrigation demands and infrastructure needs. Demand analysis showed a Phase I average annual recycled water demand of 0.60 mgd and a Phase II average annual recycled water demand of 0.94 mgd. The estimated project costs are $44 million for Phase I and $43.8 million for Phase II. Such projects may be pursued in the future should costs become better aligned with the benefits of the additional reliable supply.

2.5.3 RECYCLED WATER QUANTITY AND QUALITY

Throughout the year, NSMCSD monitors water quality to maintain compliance with Title 22 for unrestricted use. Monitoring is performed for the following: flow rate, total coliform, contact time, turbidity, dissolved oxygen, dissolved sulfides, and applicable standard observations. NSMCSD additionally monitors pH, electrical conductivity, TDS, boron, chloride, sodium, sodium adsorption ratio, adjusted sodium adsorption ratio, and bicarbonate (ESA, 2009).

3 WATER REQUIREMENTS AND SUPPLIES

3.1 CURRENT AND HISTORICAL WATER REQUIREMENTS AND SUPPLIES

South Westside Basin groundwater, imported water from the SFPUC, and small quantities of recycled water are used to meet water demands in the South Westside Basin as summarized in Table 3.1. All annual values represent calendar years. Details by agency are provided in Section 3.1.2.

Table 3.1 Summary of Current Water Supply Sources (2010)

Entity	Supply (AFY)			
	South Westside Basin Groundwater[1]	Imported Water[2]	Recycled Water[1]	Total
Burlingame	0	4,389	0	***4,389***
CalWater	453	8,075	0	***8,528***
Daly City[3]	1,743 / 3,947	5,524 / 3,320	0	***7,267***
Millbrae	0	2,482	0	***2,482***
San Bruno	2,364	1,637	0	***4,001***
Irrigators[4]	1,800	0	412	***2,212***
Total[5]	***8,564***	***19,903***	***412***	***28,879***

1 – SFPUC, 2011. Since Olympic Club and San Francisco Golf Club overlie both the North Westside Basin and South Westside Basin, the irrigation use assumes the following: Olympic Club – 50 percent of total recycled water use in the North Westside Basin and 50 percent use in the South Westside Basin; and San Francisco Golf Club – 90 percent of total recycled water use in the North Westside Basin and 10 percent use in the South Westside Basin.
2 – BAWSCA, 2011
3 - Daly City banked 2,204 AF of water in a conjunctive use arrangement with SFPUC, resulting in lower than normal groundwater production and higher than normal imported water purchases in 2010. The first value listed is the actual groundwater production and imported water purchase. The second value listed is the adjusted value.
4 –For the irrigators, all groundwater production within the South Westside Basin is listed, including estimated production in Millbrae and Burlingame. For comparison to the basin yield estimate (which does not include the Millbrae and Burlingame area; see Section 3.5.2), a total irrigation production of 1,139 and a total South Westside Basin groundwater production of 5,700 AF (7,904 AF when including banked Daly City production) should be used.

5 – Totals utilize Daly City values adjusted for conjunctive use.

Water demand in the Plan Area is somewhat higher in the summer months than in the winter months, primarily due to outdoor use and irrigation demands. The current water supply facilities are capable of meeting demands throughout the year, including summer days with high water use. The typical average monthly water supply distribution is shown in Figure 3.1, based on monthly data from the South Westside Basin municipal water purveyors.

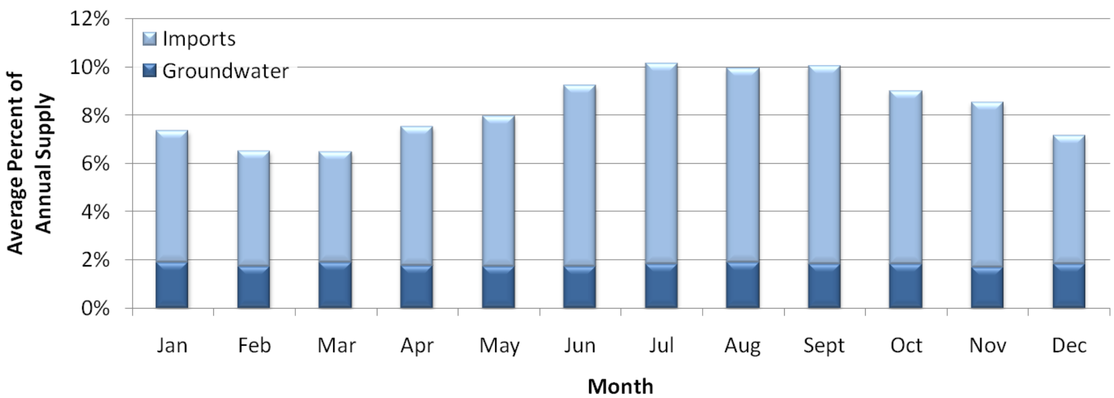


Figure 3.1 Average Monthly Distribution of Annual Municipal Supply, South Westside Basin

3.1.1 WHOLESALE WATER AGENCIES

Imported water is brought into the Plan Area by SFPUC, a wholesaler of imported water in the South Westside Basin and a retailer in the North Westside Basin.

The City and County of San Francisco, through SFPUC, own and operate a regional water system extending from the Sierra Nevada to San Francisco and serves retail and wholesale customers in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne counties. The regional water system consists of water conveyance, treatment, and distribution facilities, and delivers water to retail and wholesale customers. The existing regional system includes more than 280 miles of pipelines, more than 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants. The SFPUC currently delivers an annual average of approximately 265 mgd of water to its customers. The water supply source is a combination of local supplies from streamflow and runoff in the Alameda Creek Watershed and in the San Mateo and Pilarcitos creeks watersheds (referred to together as the Peninsula Watersheds), augmented with imported supplies from the Tuolumne River Watershed. Local watersheds provide about 15 percent of total supplies and the Tuolumne River provides the remaining 85 percent (ESA, 2009).

The SFPUC serves approximately one-third of its water supplies directly to retail customers, primarily in San Francisco, and about two-thirds of its water supplies to wholesale customers by contractual agreement. One retail customer, the Golden Gate National Cemetery in San Bruno, is located within the South Westside Basin. The wholesale customers are largely represented by BAWSCA, which consists of 27 total customers. Some of these wholesale customers have other sources of water in addition to what they receive from the SFPUC regional system, while others rely completely on SFPUC for supply (ESA, 2009).

3.1.2 Retail Agency Water Use

Details on water use by the retail agencies are presented in the following sections. Data are available from metered agency records, agency UWMPs, South Westside Basin annual groundwater reports, and BAWSCA's annual reports. From these data sources the following can be summarized: supply sources, quantification of the current supply mix, and quantification of historical groundwater production.

3.1.2.1 City of Burlingame

The City of Burlingame covers 4.3 square miles and has a population of approximately 28,000 people. Details of the Burlingame water supply system are summarized below based on the city's UWMP (EKI, 2005). Burlingame owns, operates, and maintains the potable water distribution system that serves drinking water to residential, commercial, and industrial establishments. The water supply is imported water purchased from SFPUC.

Burlingame's distribution system consists of six pumping stations, five water storage tanks, and buried pipes of varying compositions, ages, and sizes. The distribution system provides water to eight pressure zones within the city's water service area.

Approximately 80 percent of all service connections are located in the Aqueduct Zone, which contains most of Burlingame's commercial, industrial, and multi-family residence units. Water is transferred between pressure zones through a system of pipes and pumping stations. The pumping stations currently operated by the city are referred to as:

1. Donnelly
2. Easton
3. Skyview
4. Trousdale
5. Hillside
6. Sisters of Mercy (fire flow only)

Five of the pumping stations transfer water from the lower elevations of the city to the higher elevations, while the Sisters of Mercy station provides fire flow to the Sisters of Mercy property. The sizes of the pumps range between 7.5 and 75 horsepower.

The city's five water storage tanks provide aggregate water storage for 2.94 million gallons. The largest water storage facility is the Hillside Tank, which holds 1.5 million gallons. The smallest water storage facilities are the individual tanks at the Alcazar and Donnelly sites. There are two tanks at each site and each tank holds 0.05 million gallons.

The total water supply, all from SFPUC purchases, has averaged 5,100 AF over the past 14 years and has shown a slight declining trend over that time period (Figure 3.2). In 2010, the total water supply for Burlingame was 4,389 AF.

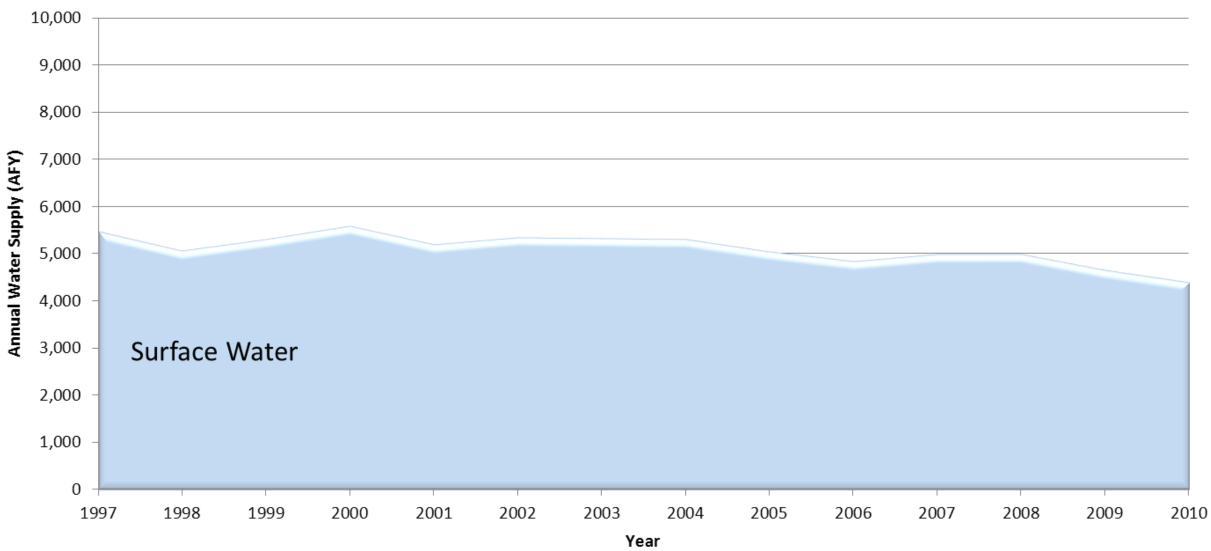


Figure 3.2 Historical Annual Water Supply, Burlingame

3.1.2.2 California Water Service Company –South San Francisco District

CalWater – South San Francisco District provides water to approximately 56,950 people in a service area of approximately 11 square miles. The service area includes South San Francisco, Colma, a small portion of Daly City, and an unincorporated area of San Mateo County known as Broadmoor, which lies between Colma and Daly City. The South San Francisco system includes 144 miles of pipeline, 12 storage tanks, one collecting tank, and 20 booster pumps.

CalWater uses groundwater and imported surface water from SFPUC to meet demands. CalWater's Individual Supply Guarantee with

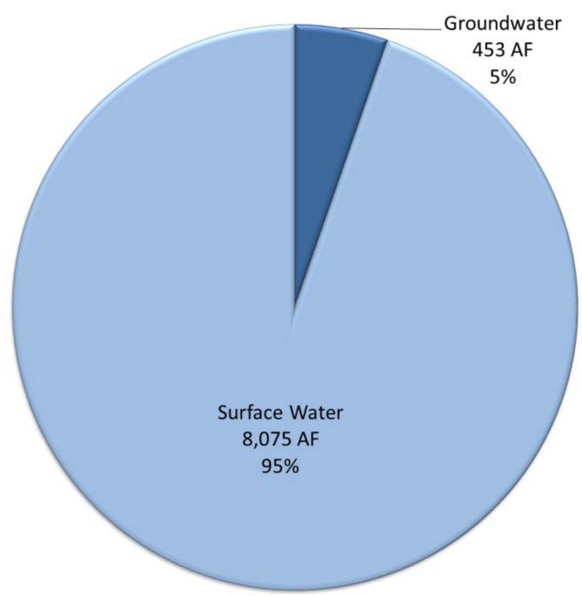


Figure 3.3a
Current (2010) Water Supply Sources, CalWater – South San Francisco District

SFPUC is 35.68 mgd (or approximately 39,967 AFY) and also supplies CalWater's other Bay Area Districts: Bear Gulch and Mid-Peninsula. Imported surface water has been used to a greater extent recently due to reduced groundwater production, as discussed in the following paragraph. In 2010, imported surface water accounted for 95 percent of CalWater's supply, while the remaining 5 percent was supplied by groundwater (Figure 3.3a).

The South San Francisco District has seven wells with a total design capacity of 1,365 gallons per minute (gpm). If operated full-time, these wells could produce 1.97 mgd (2,207 AFY). This production capacity represents approximately 20 to 25 percent of the annual demand in the district. While production in the 1950s and 1960s averaged 2,031 AFY, a maximum of 1,524 AFY has been pumped in calendar years since 1970. From 1998 to 2002, production averaged 1,212 AFY. However, recent years have seen little groundwater production due to participation in the ILPS and unforeseen issues with the wells. There was no groundwater production from 2003-2007; groundwater production steadily increased from when the wells were returned to service in 2008 to where CalWater produced 453 AF of groundwater in 2010. Historical water supplies by year are shown in Figure 3.3b. The district plans to return to earlier levels of production (1,535 AFY) in the future (CalWater, 2011).

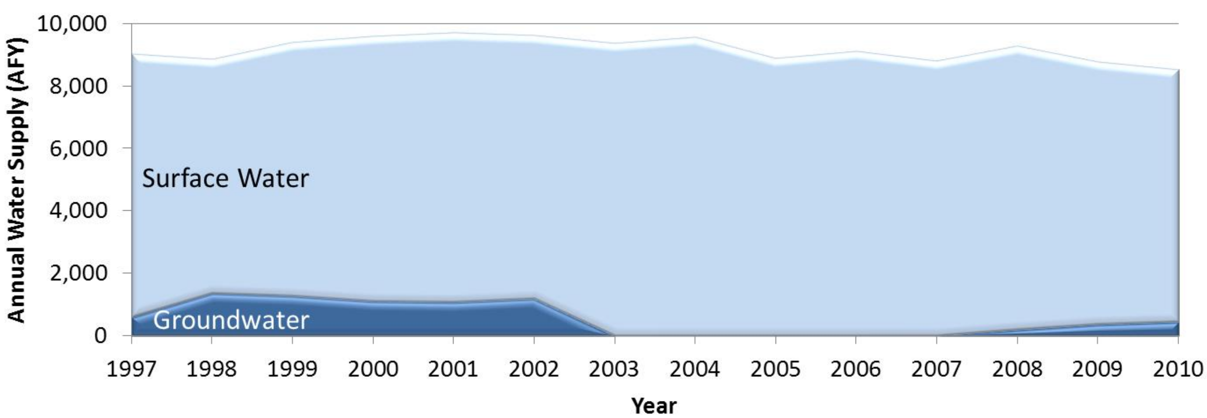


Figure 3.3b Historical Annual Water Supply, CalWater – South San Francisco District

3.1.2.3 City of Daly City

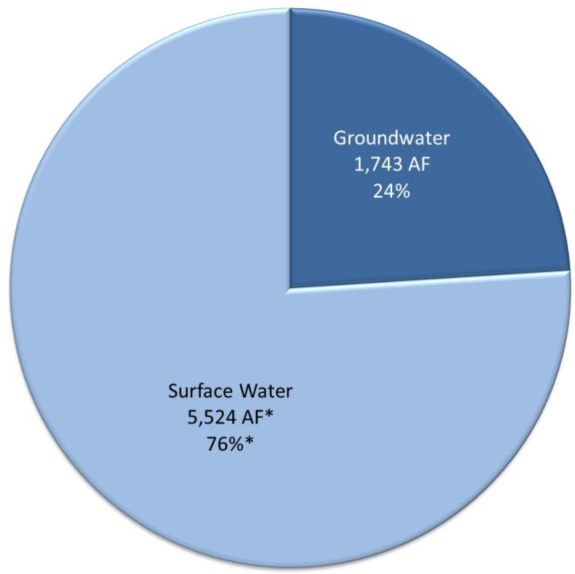
Daly City is in the northern part of San Mateo County, adjacent to the southern boundary of the City and County of San Francisco. Water service is provided by the Daly City Department of Water and Wastewater Resources. The city has an estimated 2009 population of 102,165, including small areas served by CalWater.

Daly City has three water sources: groundwater, water purchased from SFPUC, and recycled water.

Daly City's purchases of water from SFPUC are based on an Individual Supply Guarantee of 4.292 mgd (4,808 AFY) (Daly City, 2005) and are provided through 10 SFPUC turnouts. The turnouts can supply approximately 30.89 mgd at a rate of about 21,400 gpm (Daly City, 2005). During 2010, Daly City's water supply was provided by 76 percent imported surface water from SFPUC and 24 percent from local groundwater (see Figure 3.4a). The 76 percent includes participation in the ILPS. If the in-lieu water were accounted for as groundwater, the percentages would be 46 percent imported surface water and 54 percent groundwater. During normal well operation, SFPUC provides approximately 55 percent of the city's annual water supply. Daly City has been involved in the ILPS for much of the period since 2002 and purchases from SFPUC have contributed up to 92 percent of the city's annual water supply (Figure 3.4b).

Daly City has six active groundwater wells with a combined capacity of 4.25 mgd (4,760 AFY). During conjunctive use in an emergency or drought scenario, well water can contribute approximately 50 percent of the Daly City water supply (Daly City, 2005).

For the purposes of this document, recycled water produced by Daly City is accounted for under the user of the supply, Private Groundwater Producers in Section 3.1.3.



* Includes 2204 AF of in-lieu recharge water

Figure 3.4a Current (2010) Water Supply Sources, Daly City

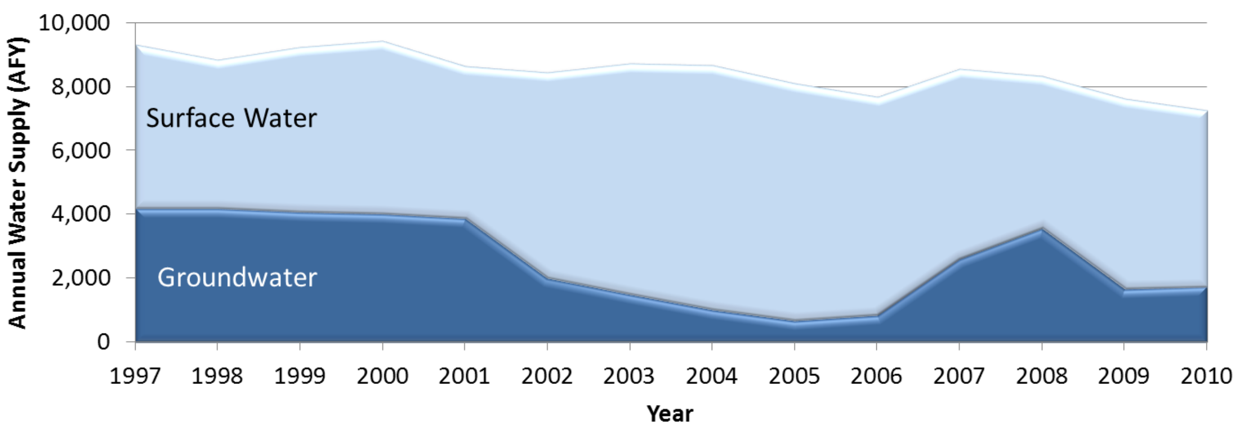


Figure 3.4b Historical Annual Water Supply, Daly City

3.1.2.4 City of Millbrae

Millbrae provides water to approximately 21,800 residents within a service area of 3.2 square miles (Figure 1.3). The City of Millbrae owns and operates approximately 70 miles of domestic water mains, 450 fire hydrants, 1,500 valves, 11 pressure reducing stations, 6 water storage tanks, 2 water pump stations, and approximately 6,500 service connections (Millbrae, 2005). Millbrae purchases its water from SFPUC and has an Individual Supply Guarantee of 3,531 AFY. Total water supplies averaged 2,790 AFY over the 1997-2010 period, and was 2,482 AF in 2010, as shown in Figure 3.5.

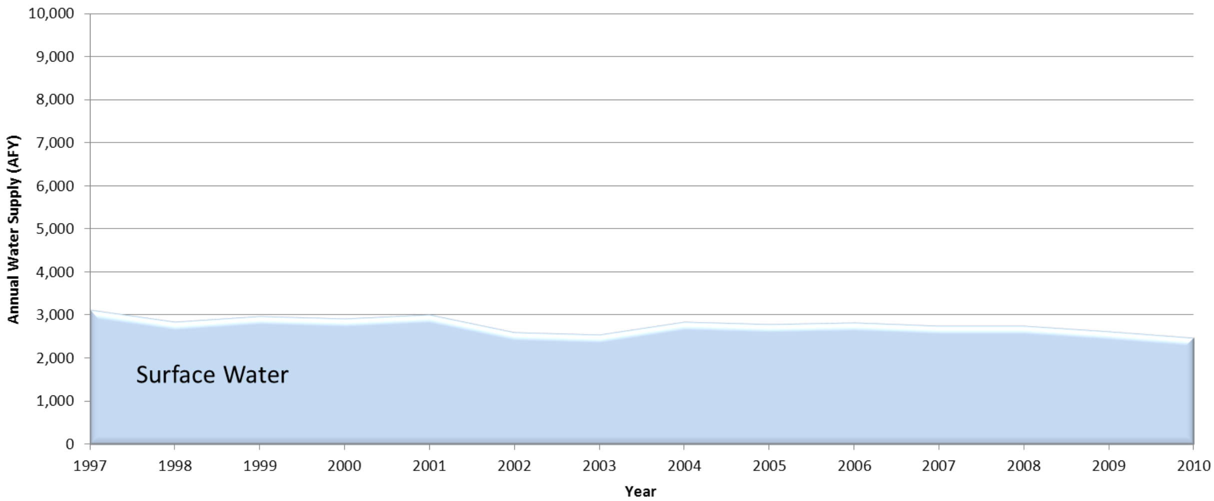


Figure 3.5 Historical Annual Water Supply, Millbrae

3.1.2.5 City of San Bruno

San Bruno owns, operates, and maintains the potable water distribution system that serves drinking water to residential, commercial, institutional, and limited industrial establishments within San Bruno's service area. The City of San Bruno covers 5.5 square miles and has a population of approximately 41,120 people. San Bruno's water system consists of five groundwater supply wells, eleven pressure zones maintained with eight booster pump stations, eight water storage tanks, one filtering plant, 900 fire hydrants, 9,000 valves, more than 100 miles of water mains ranging from 2 inches to 16 inches in

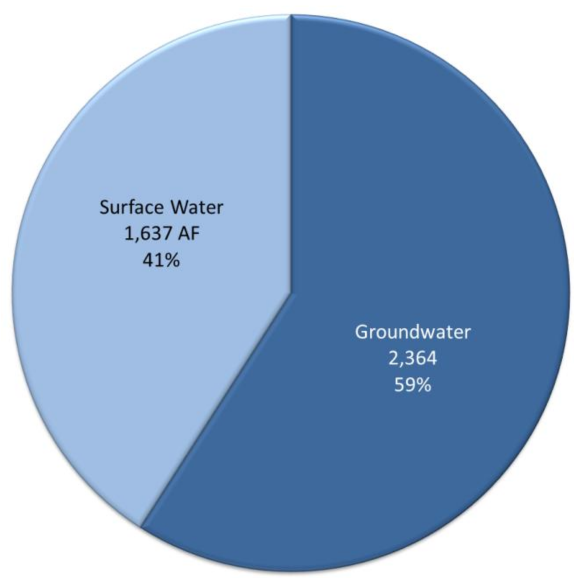


Figure 3.6a Current (2010) Water Supply Sources, San Bruno

diameter, and 12,415 metered service connections. San Bruno has four connections to the SFPUC water supply system and one connection to the NCCWD water supply system. San Bruno's water system can deliver water at a pressure of at least 30 pounds per square inch (psi) during peak-hour demand and 20 psi during maximum-day demand coincident with a fire flow (EKI, 2007).

Water supplied through the city's distribution system is a combination of groundwater pumped at San Bruno's five groundwater supply wells, and water purchased from SFPUC and NCCWD. Purchases from SFPUC are based on an Individual Supply Guarantee of 3.25 mgd (or approximately 3,600 AFY) (EKI, 2007). Note that one of San Bruno's five wells, SB-15, is not currently operational; a replacement well is in the process of sited and designed.

In 2010, groundwater wells provided 2,364 AF of water, or 59 percent of the total supply, while imported water provided the remaining 1,637 AF, as shown in Figure 3.6a. During the 1997 – 2010 period, not including the 2003-2004 In-Lieu Pilot Study, groundwater provided approximately 2,120 AFY, or 46 percent of the total supply, as shown in Figure 3.6b.

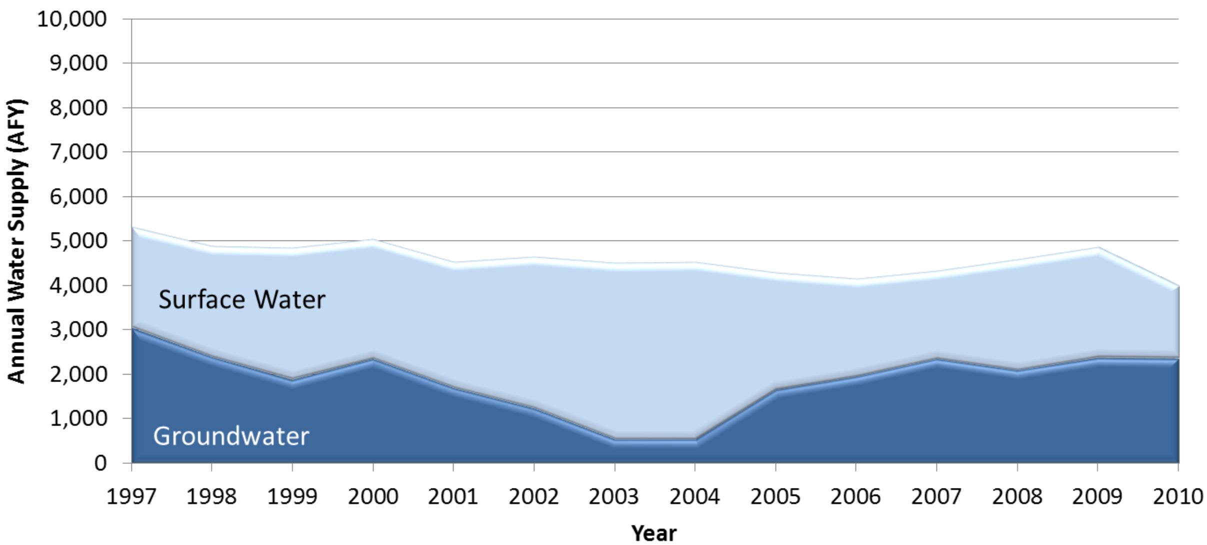


Figure 3.6b Historical Annual Water Supply, San Bruno

3.1.3 PRIVATE GROUNDWATER PRODUCERS

Private groundwater producers in the Plan Area pump groundwater primarily for irrigation of golf courses, cemeteries, and landscaping. There is some domestic production, particularly in the Hillsborough area. These users typically do not meter the volume of water produced, therefore these volumes must be estimated to present a complete picture of water use. Historical use of South Westside Basin groundwater by private groundwater producers has been estimated by HydroFocus (2011), to support the development of the Westside Basin Groundwater Flow Model (Groundwater Model), using land use, soils, and hydrologic data.

Additional data on private groundwater use is available in annual reports (SFPUC, 2011). Estimates of production are approximately 1,800 AFY based on current (2010) conditions in the basin. The 2010 estimate includes the users summarized in Table 3.2.

Table 3.2 Summary of 2010 Private Groundwater Production

Entity	2010 Production	Source	Notes
Lake Merced Golf Course	33 AF	metered (SFPUC, 2011)	
Olympic Golf Club	10 AF	metered (SFPUC, 2011)	
California Golf Club of San Francisco	237 AF	estimated* (HydroFocus, 2011)	Other estimate (Carollo, 2008) is 206 AF
Cemeteries	859 AF	estimated* (HydroFocus, 2011)	Other estimate (Carollo, 2008) is 787 AF
Subtotal, Daly City to San Bruno	***1,139 AF***		
Hillsborough area domestic wells**	326 AF	estimated* (HydroFocus, 2011)	
Green Hills and Burlingame Country Clubs**	335 AF	estimated* (HydroFocus, 2011)	
Subtotal, Millbrae to Burlingame*	***661 AF***		
Total**	**1,800 AF**		

*Estimates from HydroFocus (2011) are based on the average production using the 2008 No Project Baseline over the full 1959-2009 hydrology.

**These estimates include the Millbrae and Burlingame area production (Burlingame domestic wells, Green Hills Country Club and Burlingame Country Club). Without the Millbrae and Burlingame area, the private production is 1,139 AF. The without- Millbrae and Burlingame value is more appropriate for comparisons with the results of HydroFocus (2011) as that document summarized the private production in the Westside Basin only as far south as San Bruno. Minor differences between the average annual private production estimated by that document (1,122 AFY) and the without-Burlingame values presented here are a result of usage of calendar years in this document versus water years in the HydroFocus document, minor differences in developing the average value, and the incorporation of newly available metered data in this document.

Recycled water produced by NSMCSD is used by private groundwater producers. Much of this use is along the boundary with the North Westside Basin. For accounting purposes, recycled water use in the South Westside Basin includes use in Daly City medians, at Lake Merced Golf Club, and at the Olympic Golf Club, but not at the San Francisco Golf Club, which otherwise would use a groundwater well within the North Westside Basin. Based on this assumption, approximately 410 AF of recycled water was used in the South Westside Basin.

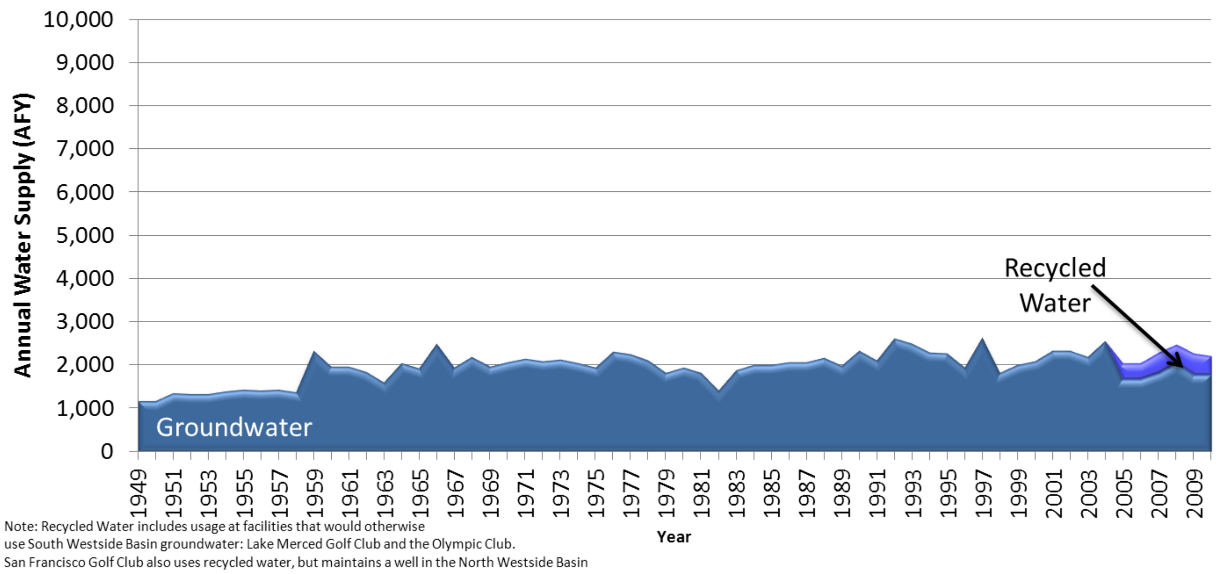


Figure 3.7 Historical Annual South Westside Basin Groundwater Production, Private Groundwater Producers

3.1.4 TOTAL SOUTH WESTSIDE BASIN

Current and historical water demands in the South Westside Basin have been met with purchases of imported surface water from SFPUC, local groundwater, and a smaller quantity of recycled water, as shown in Figure 3.8.

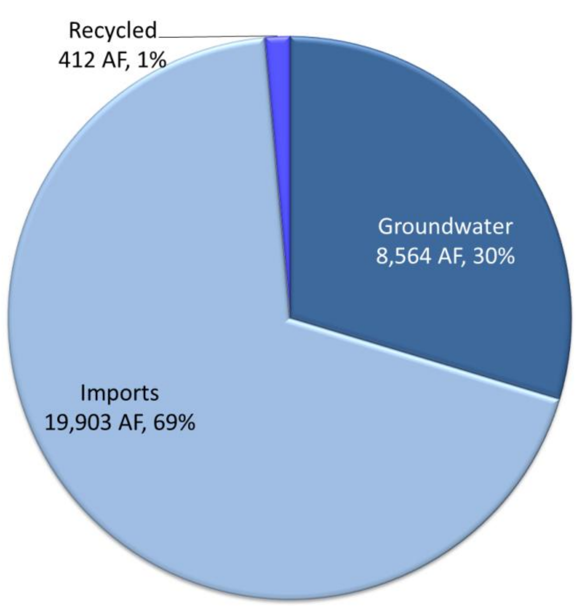


Figure 3.8 Current Water Supply Sources, South Westside Basin

South Westside Basin groundwater is an important component of the supply mix; Table 3.3 shows the percentage of the total water supply provided by groundwater in 2010 for the entities in the basin.

Table 3.3 2010 Groundwater Production by Entity as a Percent of Total Water Supply

Entity	Groundwater as Percent of Total Water Supply
Burlingame	0%
CalWater – South San Francisco District	5%
Daly City	24%*
Millbrae	0%
San Bruno	59%
private groundwater producer	81%

*54% if including in-lieu recharge

Figure 3.9 shows total annual groundwater production by major producer. In 2010, total groundwater production from the South Westside Basin was approximately 8,600 AF, including approximately 2,200 AF of banked groundwater under the ILRP to be potentially extracted at a later date. Figure 3.10 shows the distribution of groundwater production throughout the South Westside Basin, based on 2008 production data.

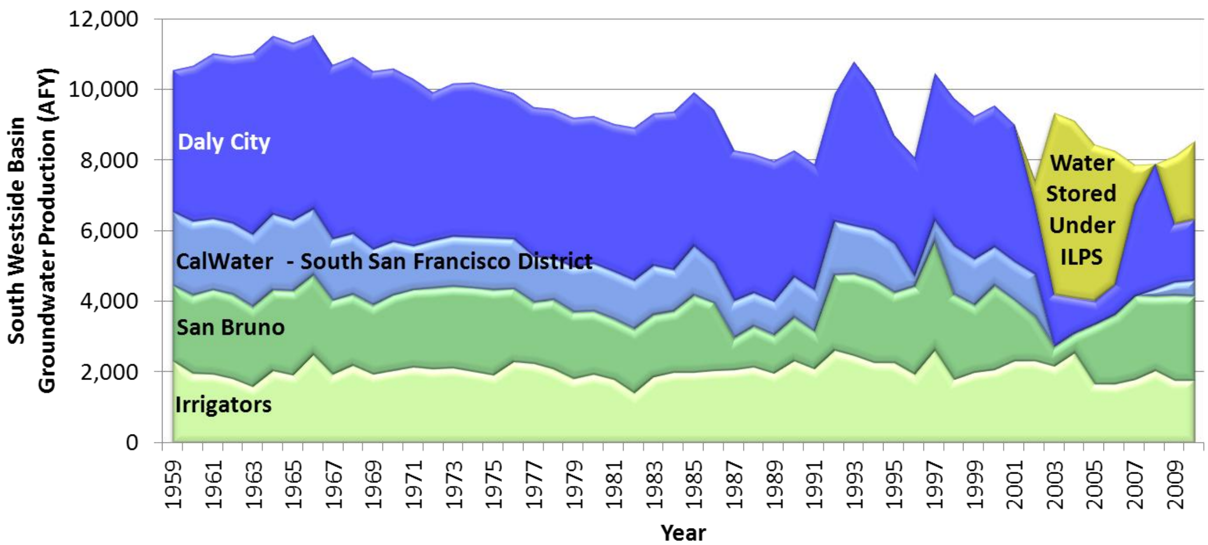


Figure 3.9 Historical Annual South Westside Basin Groundwater Production by Entity

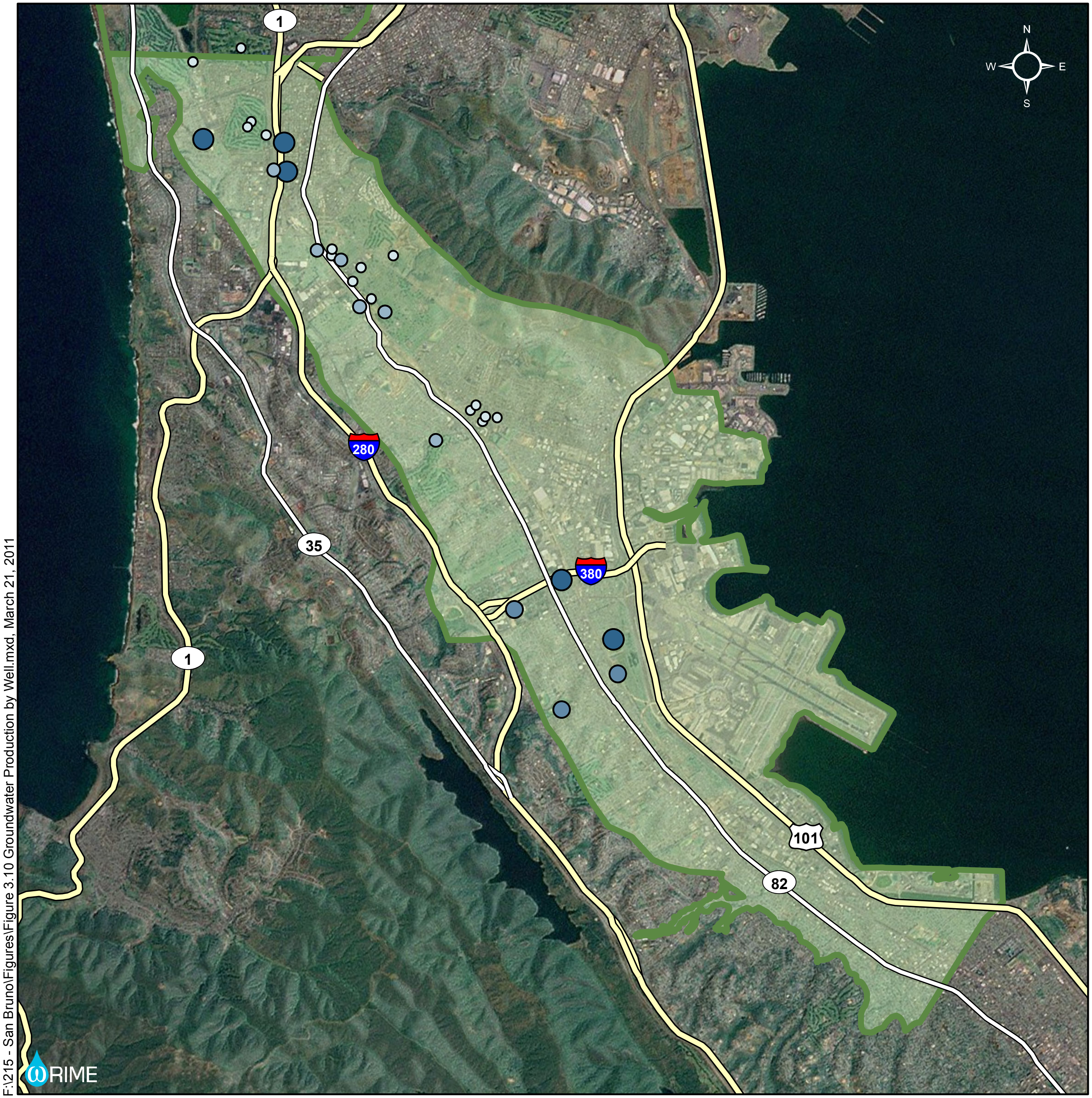


Figure 3.10
Groundwater Production by Well

Legend

Highways

Groundwater Basin

Plan Area

2008 Production (af)

1 - 100

100 - 250

250 - 500

> 500

0 0.5 1 2 Miles

Groundwater Production Sources:
CalWater, personal communication, 2009
City of Daly City, personal communicaiton, 2009
City of San Bruno, pers. comm., 2009
Hydrofocus, 2009
SFPUC, 2009

F:\215 - San Bruno\Figures\Figure 3.10 Groundwater Production by Well.mxd, March 21, 2011

3.2 CURRENT WATER BUDGET

A more thorough understanding of the groundwater conditions can be obtained through analysis of the water budget, which estimates the different inflows and outflows of the aquifer. There are several different components of inflows and outflows. A South Westside Basin water budget was estimated below based on the results of the Groundwater Model, which is described in *Westside Basin Groundwater-Flow Model: Updated Model and 2008 No-Project Simulation Results.* (HydroFocus, 2011).

The simplified version of the water budget equation for a basin is:

Inflow – Outflow = Storage Change **(1)**

Inflow, outflow, and storage consist of the following more detailed subcomponents:.

- Inflow
  - Applied water components
    - Agricultural water use
    - Landscape and outdoor irrigation
  - Recharge from precipitation
  - Boundary flow from Coast Range and San Bruno Mountain
  - Underflow from
    - North Westside Basin
    - Pacific Ocean
    - San Francisco Bay
- Outflow
  - Groundwater production
  - Underflow to
    - Pacific Ocean
    - San Francisco Bay
  - Evapotranspiration
- Groundwater storage change

Water budget estimates were based on HydroFocus's (2011) basin-wide groundwater modeling effort. That document included the development of the 2008 No Project Scenario, which simulates a 47-year continuation of anticipated land and water use conditions as of May 2008. It assumes no new projects are implemented, but includes new supply wells, planned operational changes to the magnitude and spatial distribution of pumpage, and existing recycled water projects in place as of May 2008. The 2008 No Project Baseline simulation results were averaged over the full 1959-2009 hydrology to develop an average annual water budget for the central portion of the South Westside Basin (Daly City southeast to San Bruno). The average annual water budget for the South Westside Basin is presented in Table 3.4.

Table 3.4 Estimated Average Annual* South Westside Basin Water Balance

Water Budget Component	Average Annual Volume (AFY)
Groundwater Production	8,756
Underflow to the Bayshore area	460
Underflow to Millbrae	429
Underflow to North Westside Basin	71
Total Outflow	***9,716***
Recharge, all sources	4,517
Underflow from the Bayshore area	762
Underflow from Millbrae	967
Underflow from North Westside Basin	2,167
Underflow across Serra Fault	1,109
Total Inflow	**9,522**
Change in Storage	***-194***

*Average of 1959-2009 Hydrology

The change in storage is less than zero, showing a reduction in groundwater in storage over time. However, this value is small and within the errors associated with the data and the model. For example, the 194 AFY is just 17% of the simulated unmetered groundwater production in the basin (1,122 AFY). There are significant unknowns in the volume of unmetered groundwater pumped by private groundwater producers as well as in other modeling parameters including future precipitation, recharge, and aquifer parameters. Given the uncertainties, the small change in storage, with outflows exceeding inflows by approximately 2 percent, should be considered as showing the basin essentially in balance.

3.3 PROJECTED WATER REQUIREMENTS AND SUPPLIES

Projected water use is an important component of determining the ability of a basin to meet future demands. Figure 3.11 illustrates the projected water supplies and demands through 2035 by the primary retail water agencies in the South Westside Basin using projections discussed in Section 3.3.1. Private groundwater producers are also included with the assumption of a continuation of current levels of production. The water served by the retail water agencies includes groundwater from the South Westside Basin, imported surface water purchased from SFPUC, and recycled water.

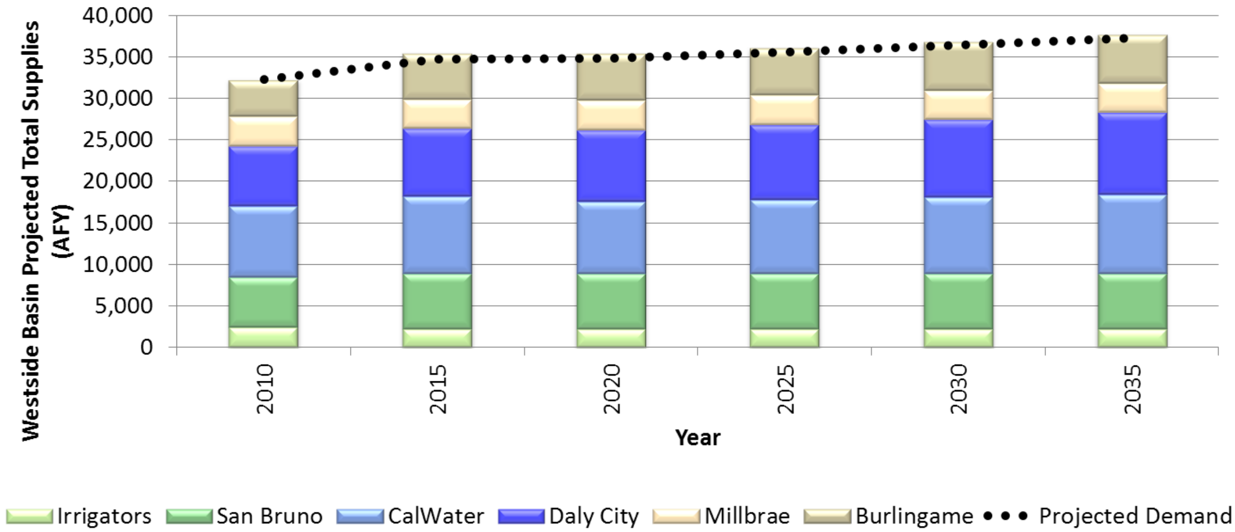


Figure 3.11 Projected Water Supplies in the South Westside Basin, by Agency

Table 3.5a presents current and projected South Westside Basin groundwater production through 2030. Table 3.5b presents the projected increase in South Westside Basin groundwater production compared to 2010 production.

While these projections represent the best available information from the agencies, they are subject to uncertainties related to climatic conditions, availability of water supplies, maintenance issues, and policy changes. Additionally, no projections are available for the private groundwater producers, whose production is assumed to remain at current levels, which themselves are largely estimated. Even with these uncertainties, the existing projections provide a good baseline for anticipated future use and for determining how the basin would respond to future use and management. These projections are not intended to set limits for the production by individual agencies; such limits may be established by the agencies in the future, but would likely be developed based on a wide range of demand and supply information, as discussed in Section 5.3.1, Action F5.

Table 3.5a Current and Projected South Westside Basin Groundwater Production (AFY)

Agency	2010	2015	2020	2025	2030	2035
Burlingame	0	0	0	0	0	0
CalWater – South San Francisco	453	1,535	1,535	1,535	1,535	1,535
Daly City	1,743* 3,947	3,349	3,842	3,842	3,842	3,842
Millbrae	0	0	0	0	0	0
San Bruno	2,364	2,364** 3,026	2,364** 3,026	2,364** 3,026	2,364** 3,026	2,364** 3,026
Private Producers* **	1,800	1,800	1,800	1,800	1,800	1,800
Total**	**8,564**	**9,048**	**9,541**	**9,541**	**9,541**	**9,541**

* Daly City's 2010 production was 1,743 AF, but does not include 2,204 AF of groundwater stored as a result of in-lieu water deliveries under the ILPS. For accounting purposes, this pumping may be included in 2010.

** San Bruno projects future groundwater production at its current rate. However, it is evaluating whether it can increase its production of groundwater to a rate of 3,026 AFY (2.7 mgd), which is consistent with a historical maximum annual production rate. San Bruno will coordinate with other basin users to ensure the groundwater basin is managed sustainably and in a manner consistent with the consensus driven basin yield analysis based on the modeling of HydroFocus, Inc.

*** Values for Private Producers include production outside of the area defined for the basin yield. See Section 3.5.

**** Totals utilize the Daly City values based on effective long-term pumping and San Bruno at its 2010 rate.

Sources: Daly City projected production: Brown and Caldwell, 2011;
San Bruno projected production: EKI, 2011;
CalWater projected production: CalWater, 2011

Table 3.5b Projected Change in South Westside Basin Groundwater Production, from 2010 Production (AFY)

Agency	2015	2020	2025	2030	2035
Burlingame	0	0	0	0	0
CalWater – South San Francisco	1,082	1,082	1,082	1,082	1,082
Daly City	1,606* -598	2,099* -105	2,099* -105	2,099* -105	2,099* -105
Millbrae	0	0	0	0	0
San Bruno	662** 0	662** 0	662** 0	662** 0	662** 0
Private Producers	0	0	0	0	0
Total*	**484**	**977**	**977**	**977**	**977**

* When compared to Daly City's actual 2010 production (1,743 AF), future Daly City groundwater production will increase by 2,099 AFY. However, Daly City's actual 2010 production does not include 2,204 AF of groundwater stored as a result of in-lieu water deliveries under the ILPS. For accounting purposes, this pumping may be included in 2010. Compared to the pumping value that includes the stored water, future Daly City groundwater production will decrease by 105 AFY.

** San Bruno projects future groundwater production at its current rate 2,354 AFY (2.1 mgd), but is evaluating its ability to increase its production of groundwater to a rate to 3,026 AFY (2.7 mgd). There is no change from the current rate, while the increase to the higher rate would be 662 AFY.

*** Totals utilize the Daly City values based on effective long-term pumping and San Bruno at its current rate.

The projected South Westside Basin supplies are shown in Figure 3.12 with the historical production discussed in Section 3.1. Projected demand in the South Westside Basin is within 300 AFY of projected supply.

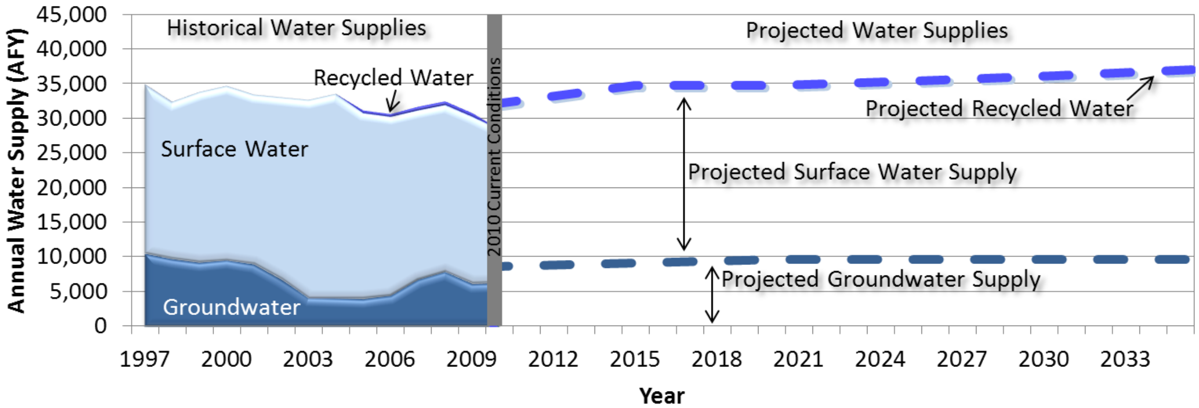


Figure 3.12 Historical and Projected South Westside Basin Groundwater Supply

3.3.1 AGENCY WATER PROJECTIONS

Detailed water supply projections for each retail water agency, as well as private irrigators, are provided in the following sections.

3.3.1.1 City of Burlingame

Water demands for the City of Burlingame are projected to increase from 4,389 AFY in 2010 to 5,852 AFY in 2035 (Burlingame, 2011), as shown in Figure 3.13. The projected supply meets the projected demand. No groundwater use is projected and imported water use is projected to stay within the city's Individual Supply Guarantee of 5,867 AFY.

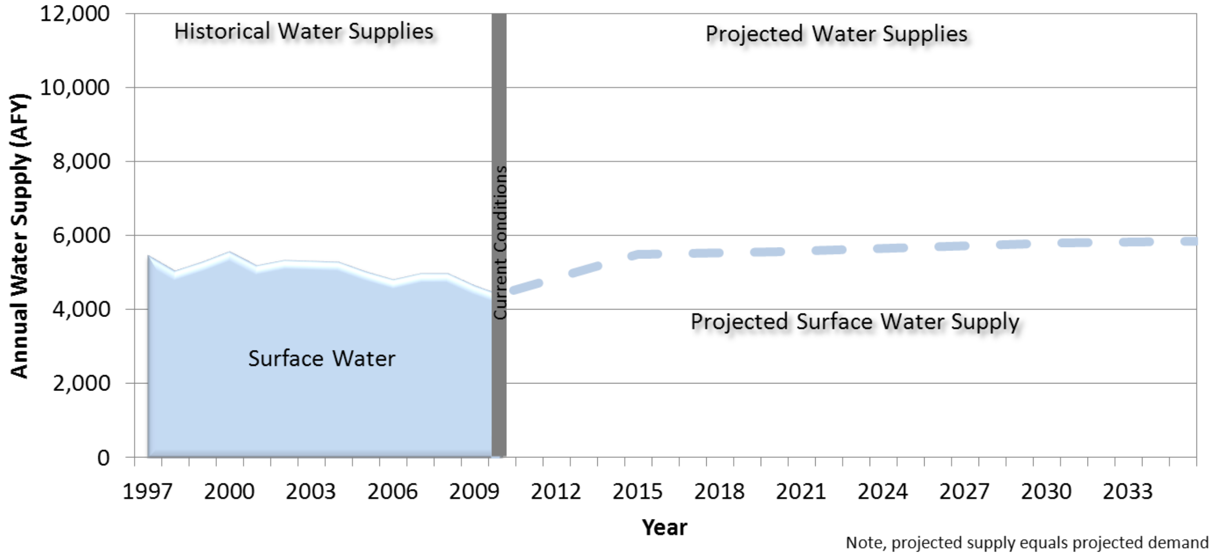


Figure 3.13 Projected Water Supply for Burlingame

3.3.1.2 California Water Service Company – South San Francisco District

Water demands for CalWater's South San Francisco District service area are projected to increase from 8,527 AFY in 2010 to 9,494 AFY in 2035. These demands will be met through:

- Approximately 1,100 AFY of additional South Westside Basin groundwater supplies as CalWater returns its wellfield to producing 1,535 AFY
- Reduction of surface water purchases by approximately 200 AFY (CalWater, 2011)

CalWater's projected supplies are shown in Figure 3.14. The projected supply meets the projected demand.

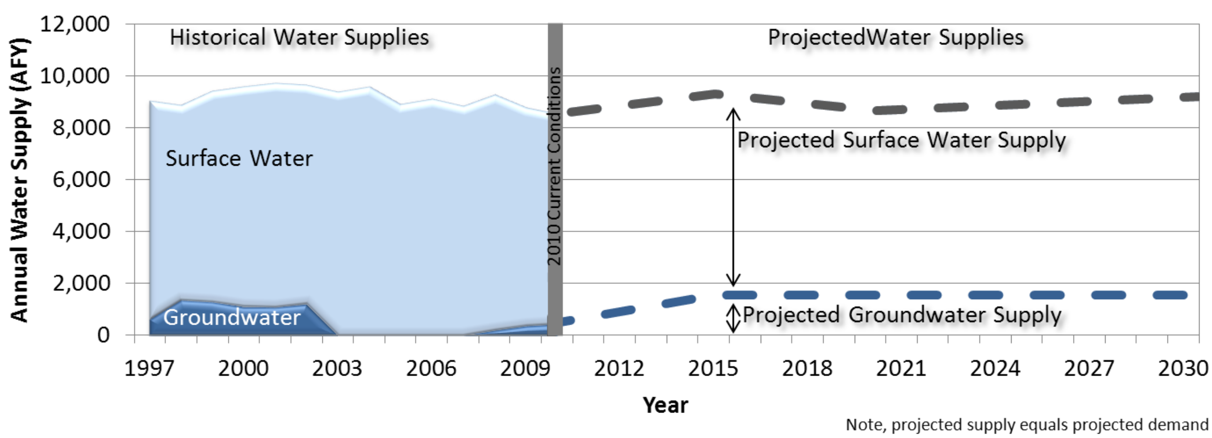


Figure 3.14 Projected Water Supply for CalWater

3.3.1.3 City of Daly City

Water demands for Daly City are projected to increase from 7,267 AFY in 2010 to 10,552 AFY in 2035. These demands will be partially met through:

- A decrease of approximately 100 AFY of South Westside Basin groundwater supplies
- An increase in surface water purchases by approximately 2,700 AFY (Brown and Caldwell, 2011)

These values are compared to 2010 supplies with in-lieu surface water deliveries accounted for as South Westside Basin groundwater. Total projected supplies in 2035 are 9,858 AFY and are less than the projected demand of 10,552 AFY. Daly City's projected supplies are shown in Figure 3.15. Imported water use is projected to exceed Daly City's Individual Supply Guarantee of 4,808 AFY, with a projected surface water supply of 6,016 AFY by 2035 (Daly City, 2011).

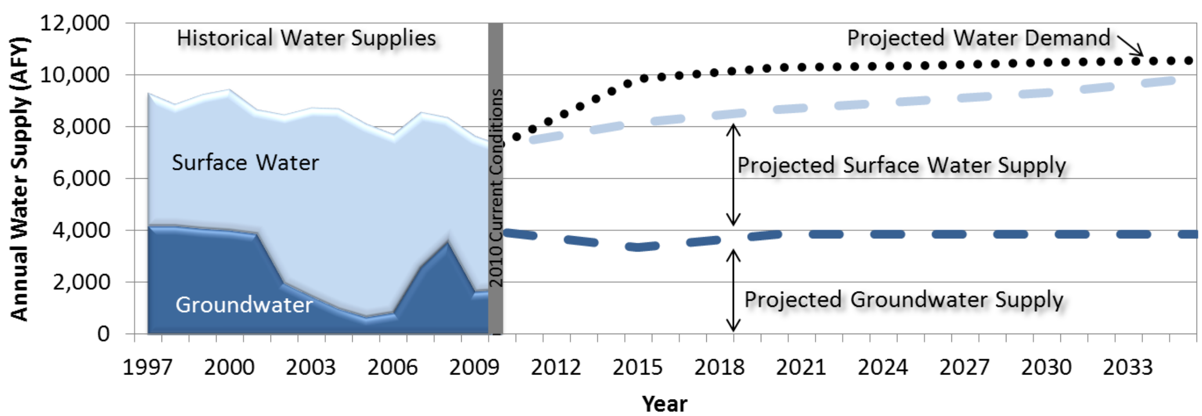


Figure 3.15 Projected Water Supply for Daly City

3.3.1.4 City of Millbrae

Water demands for Millbrae are projected to increase from 2,482 AFY in 2010 to 3,379 AFY in 2035. By 2035, total surface water supplies are projected to total 3,558 AFY (Millbrae, 2011), as shown in Figure 3.16. No groundwater use is projected and imported water use is projected to slightly exceed the city's Individual Supply Guarantee of 3,533 AFY.

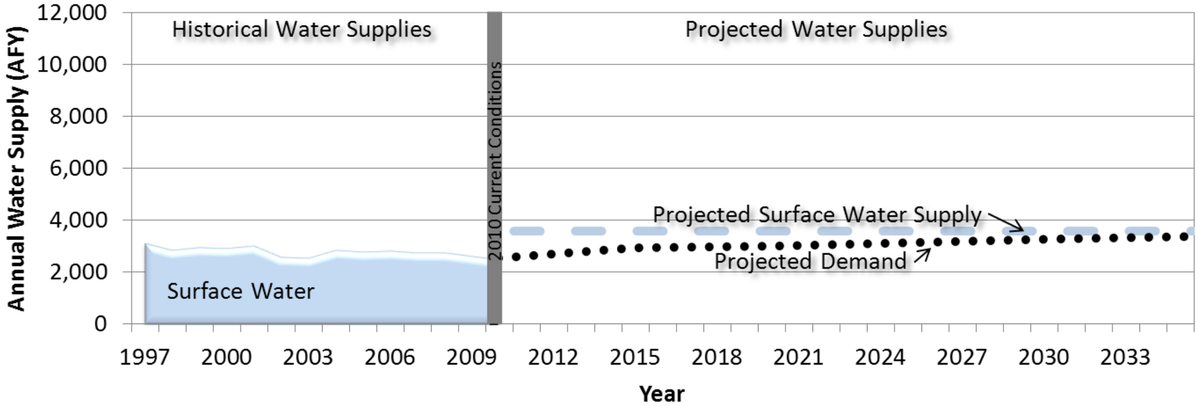


Figure 3.16 Projected Water Supply for Millbrae

3.3.1.5 City of San Bruno

Water demands for San Bruno are projected to increase from 4,001 AFY in 2010 to 5,751 AFY in 2035. These demands will be met through:

- Continued South Westside Basin groundwater production at 2,364 AFY
- Increase in surface water purchases from SFPUC and NCCWD from 1,637 AFY to 3,699 AFY
- Potential additional future groundwater production of 673 AFY. San Bruno will evaluate its ability to increase its groundwater production to 2.7 MGD, which is consistent with its historical maximum production rate. (EKI, 2011)

San Bruno's projected supplies are shown in Figure 3.17. Projected imported water purchases would be within San Bruno's Individual Supply Guarantee of 3,643 AFY.

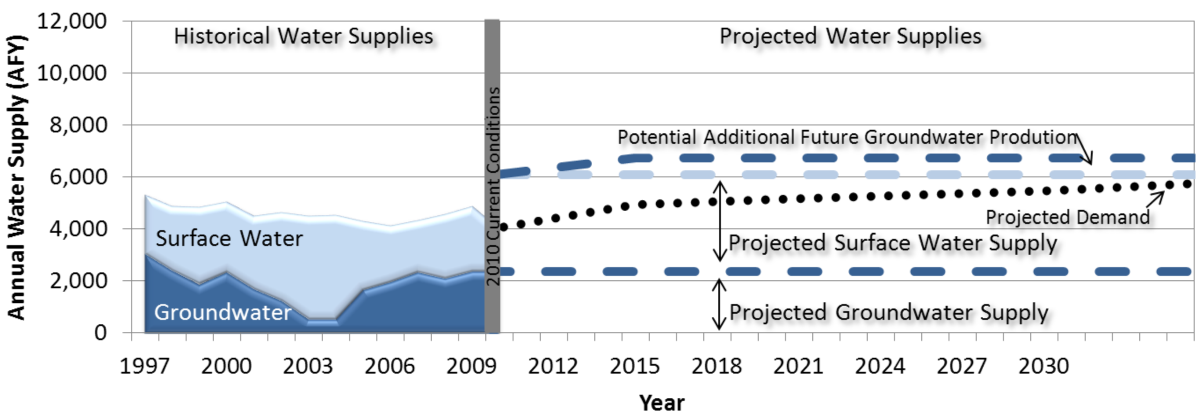


Figure 3.17 Projected Water Supply for San Bruno

3.3.2 Private Groundwater Producers

No projections of private groundwater use are available. Modeling results show an average demand of approximately 1,800 AFY (see Section 3.1.3). Future use is assumed to continue at this level. Of the 1,800 AFY, 1,139 AFY is produced from the area used to estimate basin yield, as described in Section 3.5

3.4 PROJECTED WATER BUDGET

The projected changes in South Westside Basin groundwater production indicated in agency projections in Section 3.3, show an increase in groundwater production of 977 AFY (Table 3.5b), from 8,564 AFY in 2010 to a projected 9,541 AFY in 2035.

The historical water budget analysis in Section 3.2 showed a basin only slightly out of balance under modeled conditions (8,756 AFY of groundwater production), with a change in storage of approximately -200 AFY. Groundwater production within the central portion of the South Westside Basin (Daly City southeast to San Bruno (an area consistent with the area analyzed in the historical water budget) is projected to increase from 7,904 AFY in 2010 to 8,881 AFY in 2035. This represents only a small increase in groundwater production of 124 AFY over the conditions analyzed in the historical water budget, leaving the basin nearly in balance.

The goals, objectives, elements, and implementation plan presented in the following sections seek to maintain this balance, accounting for increased competition for imported supplies and measures to improve the quantity of groundwater available to the stakeholders in the South Westside Basin.

3.5 BASIN YIELD

3.5.1 Basin Yield Definition

Basin yield is defined in this document as the maximum average annual groundwater production that could be maintained for a long-term time period and that would result in stable groundwater levels. This value does not explicitly take into consideration water quality, surface water resources, or environmental or socio-economic consequences. The basin yield is intended to be used along other data to guide groundwater management. Any use of groundwater has an impact; the aim of the basin yield is to assist in understanding the balances between the use of the groundwater and the impacts caused by that use. The balances in the Westside Basin are based on the following:

- There is a desire to maintain a sustainable groundwater reservoir by not pumping at levels that result in long-term declines in groundwater levels. Avoiding these declines will also avoid increased pumping costs and the need to deepen wells.

- o There is a desire to maintain groundwater levels at elevations that prevent or slow the migration of poor quality groundwater. Poor quality groundwater includes the point-source and non-point source contaminants discussed in Section 2.3.8 as well as seawater intrusion discussed in Section 2.3.3.
- o As there is little interaction between groundwater and surface water resources in the area, impacts to surface water resources are not directly considered.
- o The basin yield estimate will change over time in response to changing hydrology, groundwater production infrastructure, and the built environment. As such, the basin yield definition and estimate is intended to be reviewed and updated at regular intervals.

3.5.2 BASIN YIELD ESTIMATE

A variety of methods may be used to estimate basin yield. These include:

- Analysis of historical production and groundwater levels, identifying periods with stable water levels (if any) and the associated level of groundwater production.
- Development of a water budget to estimate inflow and outflows from the basin. Yield is then estimated as the sum of the change in storage and the volume of groundwater production.
- Development of a numerical groundwater model and simulations to estimate the yield.

The estimate of basin yield is developed through the use of the Groundwater Model, which incorporates the best available knowledge of the basin and was developed in a cooperative manner with extensive input. Basin yield is estimated as a level to maintain current groundwater levels. To reduce risk of seawater intrusion, groundwater levels need to be raised through increased recharge or decreased production. Higher groundwater levels would also reduce pumping costs and could help control migration of lower quality groundwater. Addressing seawater intrusion through the basin yield estimate may be revisited during implementation of the GWMP.

The basin yield estimate is based on work performed by HydroFocus (2011) to determine sensitivity to pumping and the level of municipal pumping that results in zero change in storage. The estimate does not include the southern portion of the South Westside Basin, including the Millbrae and Burlingame areas, due to limited groundwater use and higher model uncertainty due to limited data. In that groundwater modeling exercise, the near-term anticipated groundwater production was modeled over historical hydrology and recent land use. Recent groundwater elevations were used as initial conditions. Municipal groundwater production was then adjusted based on calculated uniform percentages for each water purveyor to determine a level of production that results in zero long-term change in storage. Production by private producers was left unchanged. The level of groundwater production with no long-term change in storage estimated by this scenario is approximately 10,600 AFY for the entire Westside Basin and approximately 8,600 AFY for the South Westside Basin. This value is consistent with the historical water budget analysis shown in Table 3.4, which showed a decline in storage of 194 AFY with a production of 8,756 AFY. These basin yield estimates are based on the current operating conditions in the basin; changes to the operating conditions in the basin may increase the yield (such as through capturing outflow to the Pacific Ocean through increased production or through increased recharge to the basin) or decrease the yield (such as by increasing outflows to the Pacific Ocean or San Francisco Bay through higher groundwater levels). Simulations indicated that groundwater production could be increased in one portion of the basin if production in adjacent areas is reduced. This is a result of the connectivity of the South Westside Basin aquifer and highlights that the aquifer is a shared resource among all groundwater producers. Due to the connectivity of the aquifer throughout the basin, the basin yield estimate is presented at the scale of the South Westside Basin.

Additional work was performed to estimate the variability of basin yield with respect to hydrology. Historical hydrology during the 1959-2009 time period simulated in the Groundwater Model was analyzed, and it was estimated that wet periods experienced approximately 30 percent more precipitation and dry periods experienced approximately 30 percent less precipitation than the overall average precipitation. Two additional model scenarios were developed, one with precipitation increased 30 percent across the full modeling period and one with precipitation decreased 30 percent across the full modeling period. The same methodology was applied to determine basin yield under these wetter and drier conditions. The estimated wetter period yield is 9,700 AFY and the estimated drier period yield is 7,200 AFY. Given the uncertainty in future hydrology, these values provide a range of yields to be used with the overall estimated basin yield of 8,600 AFY, which is based on historical hydrology.

Figure 3.18 compares the range of basin yield estimates to historical and projected groundwater production, showing that recent production is within the basin yield, although historical production exceeded the basin yield. The production shown in Figure 3.18 includes only production within the area defined for the basin yield estimate (i.e., does not include production in Burlingame and Hillsborough).

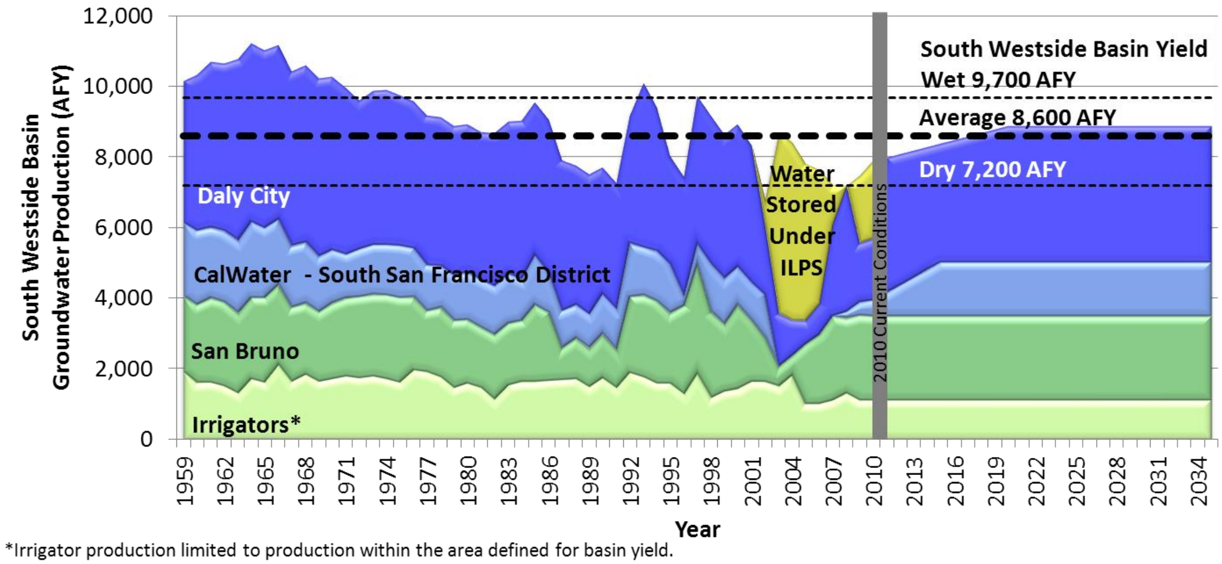


Figure 3.18
Comparison of Basin Yield Estimate and Historical Groundwater Production

Projected future production for 2020-2035 is 8,881 AFY, slightly above the average basin yield of 8,600 AFY, but within the range of yield.

These estimates are subject to uncertainty inherent in any groundwater model. Regular monitoring of static groundwater levels will assist in determining if groundwater levels are responding as anticipated over the long term.

3.5.3 Basin Yield Use

The Basin Management Objectives described later in this document are based upon groundwater levels rather than production volumes. As groundwater production is the most significant component of outflow from the basin, an understanding of the basin yield can assist in policy decisions on production which will directly impact groundwater levels in the basin. However, careful consideration must be given before using the basin yield to drive policy decisions.

- First, basin yield is a long-term average annual value. Dry years or other operational needs may require production above the basin yield; this can be acceptable if previous or subsequent years balance production with reduced pumping.
- Second, options to bring the basin into balance with the basin yield include increasing the volume recharged to the aquifer in addition to reducing groundwater production.
- Third, the basin yield is not a static value. Changes in the understanding of the groundwater basin, climate, land use, and location and quantity of groundwater production can all alter the estimate of basin yield. For example, decreasing production may bring production closer to the basin yield, but it will also reduce the basin yield

through reduced capture of additional recharge (less recharge due to higher groundwater levels) and increased natural discharge (more discharge to surface water due to higher groundwater levels). The availability and cost of alternate water supplies or development of recharge projects can also require revisions of the basin yield as this changes the socioeconomic impact of changes in groundwater production.

- Finally, benefits may be seen by approaching the basin yield value, even if the value itself is not met. Additional benefits can also be accrued by pumping significantly below the basin yield, through increasing groundwater levels resulting in increased groundwater in storage, decreased risk of seawater intrusion, and decreased energy costs for groundwater production.

4 GOAL AND OBJECTIVES FOR THE BASIN

4.1 SOUTH WESTSIDE BASIN GOAL

The goal of the GWMP is to ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management.

Sustainable is defined for this GWMP as being able to continue groundwater production over the next 50 years or more with a similar real cost, quantity, and end-user quality as today. Beneficial uses include water supplies for municipal use, irrigation use, private wells, and environmental purposes.

Basin Management Objectives (BMOs) are required by SB 1938 , which amended Section 10753.7of the Water Code to state that groundwater management plans must include BMOs, including components relating to the monitoring and management of groundwater levels within the groundwater basin, groundwater quality degradation, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin.

The following five BMOs are defined to support this goal:

1) Maintain Acceptable Groundwater Levels
2) Maintain or Improve Groundwater Quality
3) Limit the Impact of Point Source Contamination
4) Explore Need for Land Subsidence Monitoring
5) Manage the Interaction of Surface Water and Groundwater for the Benefit of Groundwater and Surface Water Quantity and Quality

In turn, elements needed to meet the BMOs are presented in Section 5 (Elements of the Groundwater Management Plan), and an implementation plan is presented in Section 6 (Implementation) to support the objectives and elements. Together the goal, BMOs, elements, and implementation plan function as the overall groundwater strategy for the South Westside Basin. The BMOs are intended solely for these uses.

4.2 BASIN MANAGEMENT OBJECTIVE COMPONENTS

Basin management objectives, are adaptable, quantifiable objectives with prescribed monitoring and defined reporting and responses. These are the accomplishments that need to occur to meet the overall basin goal stated above. BMOs are defined through:

- Management areas and sub-areas
- Public input
- Monitoring
- Adaptive management
- Enforcement

4.2.1 Management Areas and Sub-areas

The management area is the entire Plan Area, as described in Section 1.2 and shown in Figure 1.1. Sub-areas are not needed and not defined because of the continuous nature of the aquifer system. Changes in aquifer characteristics across the South Westside Basin are gradual and are not conducive to defining sub-areas based on physical properties.

Future efforts should evaluate incorporating the North Westside Basin and its associated Sub-Areas and BMOs into a Groundwater Management Plan for the entire Westside Basin. The North Westside Basin is separated from the South Westside Basin only by a jurisdictional boundary (the county line).

4.2.2 Public Input

Public input is important in establishing BMOs. Local knowledge is needed to develop appropriate objectives and local acceptance is necessary to ensure implementation. Public input for the BMOs was gathered through Advisory Committee meetings and public meetings, as described in Sections 1.6 and 1.7.

4.2.3 Monitoring

Accurate, consistent, and accepted monitoring is necessary to ensure the BMOs are being met. This monitoring will show if objectives, which are quantitative to the extent possible, are being met and will trigger actions if defined thresholds are crossed. The monitoring must allow for quick and easy data sharing among all stakeholders to gain acceptability and to allow for action, if needed, in a timely fashion. Monitoring protocols are described under each BMO, in Section 2.3.12, and in Appendix C.

4.2.4 Adaptive Management

Every year brings new data and new conditions to the groundwater aquifer. As such, the BMOs are intended to be flexible and adaptive, allowing for changes due new physical, hydrologic, or operational conditions or new understanding of the physical system. Adjustments to BMOs are discussed in Section 5.7, Reporting and Updating.

4.2.5 ENFORCEMENT

In its current form, the GWMP does not have enforcement mechanisms for the BMOs. The BMOs are guidelines to be monitored and reported on for the benefit of all South Westside Basin users. As the BMOs are defined to meet a common goal, the Advisory Committee believes that enforcement will not be necessary. However, future plan revisions may implement enforcement mechanisms if deemed necessary by the Groundwater Task Force.

4.3 BASIN MANAGEMENT OBJECTIVES

The BMOs include definitions of acceptable groundwater levels, groundwater quality, land subsidence, and surface water/groundwater interaction, along with actions to be taken if defined triggers are met.

4.3.1 MAINTAIN ACCEPTABLE GROUNDWATER LEVELS

The BMO for groundwater levels is designed to maintain operationally acceptable groundwater levels. Operational acceptability is based on avoiding the following infrastructure impacts:

- **Water levels below the top of the existing well screens.** Water levels that are below the top of the screen can negatively impact efficiency of wells through higher incrustation rates, cascading water, and reduced hydraulic efficiency. Several municipal production wells have pumping water levels below the top of the screen under current conditions. Additional lowering of water levels beyond current and historical water levels may adversely impact the ability and cost to pump groundwater, on a case-by-case basis.
- **Water levels below existing pump intakes or bottoms of well screens.** These situations should be avoided whenever possible, as under such conditions groundwater cannot enter the well or cannot be pumped to the surface.

These BMOs are set to maintain conditions for operational purposes; however, they are not currently designed to fully meet the goal of sustainability. Current water levels and water levels meeting the above criteria can remain well below sea level, posing a risk for seawater intrusion. Geologic barriers appear to have thus far prevented seawater from intruding along the Pacific Coast or San Francisco Bay (see Section 2.3.3), but no barrier is perfect and the best way to prevent seawater from migrating into the aquifer is to maintain groundwater levels at or above sea level. Future revisions to this GWMP may seek to raise groundwater level targets to provide a more sustainable water level or may investigate alternate methods of preventing seawater intrusion, such as injection barriers. Such revisions to the GWMP will need to be developed in a manner that can meet the overall goal and will need to function within any then-existing conjunctive use agreements that may require availability of subsurface storage space.

Until then, this BMO will serve as a first step toward managing groundwater levels in the South Westside Basin.

Groundwater level monitoring, triggers, and actions are initially defined below for each well with available data. Note that these items are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the "CUP" wells. The static water level monitoring will monitor progress toward meeting BMOs. Monitoring includes static groundwater level measurements from April (spring) and October (fall) of each year from the designated wells. See details on static water level monitoring protocols are provided in Appendix C

4.3.1.1 Triggers

Groundwater level measurements will be adjusted to reflect conditions without any stored water, determined by modeling results that include conjunctive use projects. Trigger thresholds are developed based on historical water levels as these levels have been considered operationally acceptable by the groundwater producers in the South Westside Basin. The triggers are defined as follows:

- Trigger 1: Groundwater elevations below the historical minimum elevation (more details provided later in this section)
- Trigger 2: Groundwater elevations 10 ft below the historical minimum elevation

Adjustments to water level measurements are needed to account for water stored in the aquifer as part of a conjunctive use study and not part of the native groundwater supply. As this BMO addresses native groundwater, stored GSR Project and ILPS water, which is intended to be recovered, should not be included in BMO monitoring. The adjustment will be made based on differences seen in the Groundwater Model (HydroFocus, 2011) comparing water levels with conjunctive use and without conjunctive use, as shown in the equation below.

$$GWSE_{adjusted} = GWSE_{measured} + GWSE_{modeled,without\ conjunctive\ use} - GWSE_{modeled,with\ conjunctive\ use}$$

where GWSE = groundwater surface elevation

As modeling is required to analyze water levels without the conjunctive use project, reporting will only occur when the Groundwater Model is updated to extend the hydrologic period. It is anticipated that this will occur annually, although biennial updates may be sufficient and may be adopted during implementation. The method of adjustment may be altered if a more accurate and consistent method is identified and accepted by the Groundwater Task Force.

Groundwater level BMO triggers are shown in Table 4.1 based on the hydrographs included in Appendix D. The data presented uses the Groundwater Model to remove the impacts of the In-Lieu Pilot Study (see Section 1.5.3) initiated in 2002 between San Bruno, CalWater, Daly City, and SFPUC. These adjustments are intended solely for the use of BMO development. Trigger 1 for the BMOs is based on the historical low water level without the effects of the ILPS. For wells designated for seawater intrusion monitoring, Trigger 1 is the historical low minus two feet, rounded down. For other wells, Trigger 1 is the historical low minus five feet, rounded down to the nearest five. Trigger 2 is 10 feet below Trigger 1 for all wells. Well locations are shown in Figure 4.1.

4.3.1.2 Actions

If Trigger 1 is met, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, potential impacts to groundwater producers or the environment, and the most appropriate actions, both immediate and upon Trigger 2 (if met). Actions will be based on plan elements defined in Section 5 (Elements of the Groundwater Management Plan). These actions may include:

- Continued operation
- Conservation measures
- Increased monitoring
- Decreased production, potentially including assignment of pumping thresholds for individual entities
- Accelerated development of artificial or in-lieu recharge projects
- Substitution of alternate supplies
- Reoperation of existing wells or construction of new wells to move production to other parts of the basin

If Trigger 2 is met, the actions defined for Trigger 1, and any additional measures, actions, or mechanisms deemed necessary by the Groundwater Task Force, will be implemented.

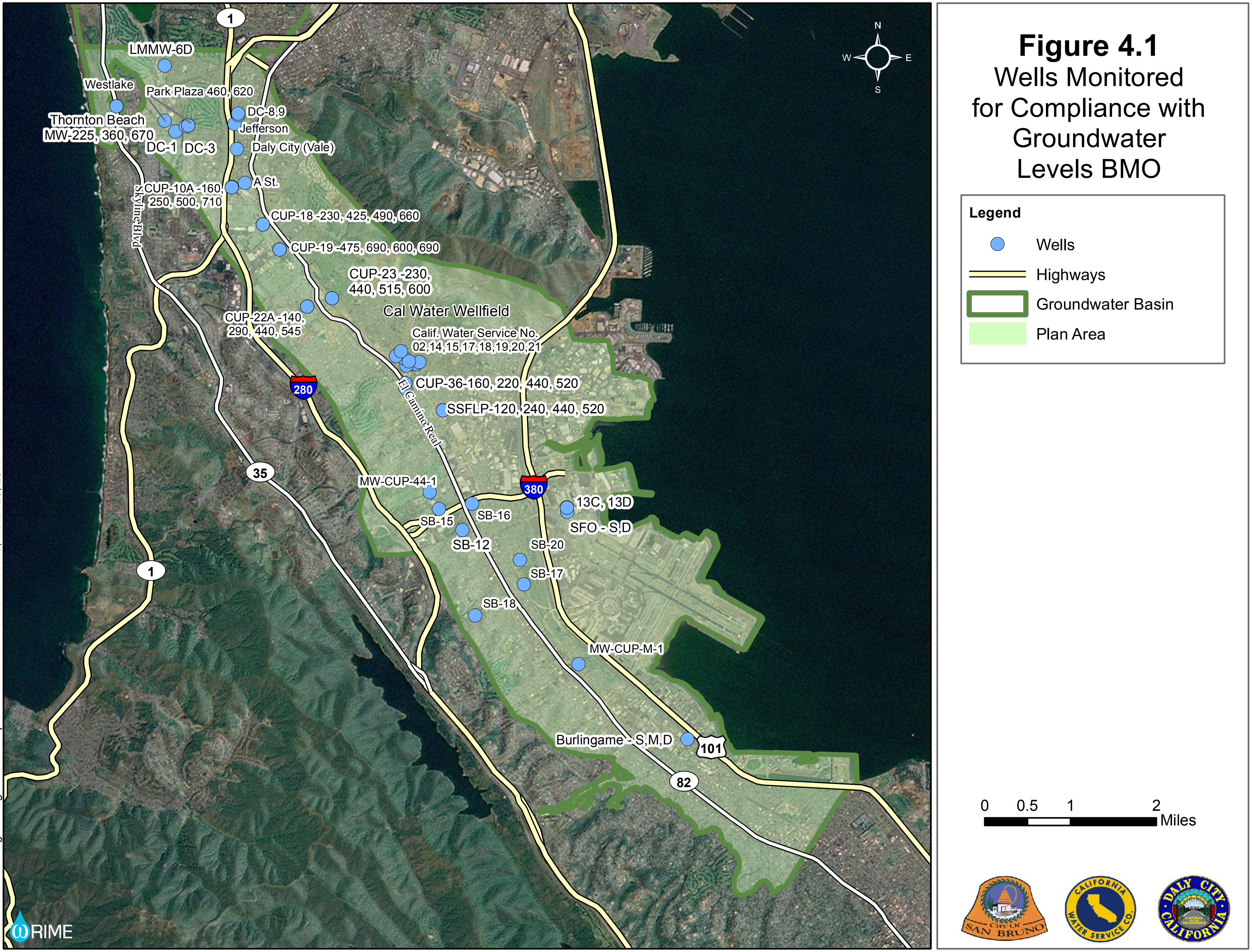
Table 4.1 Groundwater Level BMO Triggers

BMO Wells	Well Owner	Trigger 1 Adjusted Static Water Level (feet NAVD88)	Trigger 2 Adjusted Static Water Level (feet NAVD88)
SSF 1-02	CalWater	-130	-140
SSF 1-14	CalWater	n/a	n/a
SSF 1-15	CalWater	n/a	n/a
SSF 1-17	CalWater	n/a	n/a
SSF 1-18	CalWater	n/a	n/a
SSF 1-19	CalWater	n/a	n/a
SSF 1-20	CalWater	-220	-230
SSF 1-21	CalWater	n/a	n/a
DC-1 (Westlake)	Daly City	-130	-140
DC-3	Daly City	n/a	n/a
DC-8	Daly City	-165	-175
DC-9	Daly City	n/a	n/a
A Street Well	Daly City	n/a	n/a
Jefferson Well	Daly City	n/a	n/a
Vale Well	Daly City	n/a	n/a
Westlake 1	Daly City	n/a	n/a
Westlake 2	Daly City	n/a	n/a
Burlingame-S*	**San Bruno**	**-1**	**-14**
Burlingame-M*	**San Bruno**	**-4**	**-17**
Burlingame-D*	**San Bruno**	**-7**	**-20**
SB-12	San Bruno	-225	-235
SB-15	San Bruno	n/a	n/a
SB-16	San Bruno	n/a	n/a
SB-17	San Bruno	n/a	n/a
SB-18	San Bruno	n/a	n/a
SB-20	San Bruno	n/a	n/a
SFO-S*	**San Bruno**	**-2**	**-15**
SFO-D*	**San Bruno**	**-39**	**-51**
13C*	**UAL**	**-45**	**-57**
13D*	**UAL**	**-4**	**-16**
Fort Funston-S*	**USGS**	**2**	**-11**
Fort Funston-M*	**USGS**	**8**	**-5**
Thornton Beach MW 225*	Daly City	75	60
Thornton Beach MW 360*	**Daly City**	**11**	**-2**
Thornton Beach MW 670*	**Daly City**	**9**	**-4**
LMMW-6D*	SFPUC	-50	-60

BMO Wells	Well Owner	Trigger 1 Adjusted Static Water Level (feet NAVD88)	Trigger 2 Adjusted Static Water Level (feet NAVD88)
Park Plaza MW 460*	SFPUC	-120	-130
Park Plaza MW 620*	SFPUC	-220	-230
MW-CUP-10A-160*	SFPUC	55	45
MW-CUP-10A-250*	SFPUC	40	25
MW-CUP-18-230*	SFPUC	-70	-85
MW-CUP-18-425*	SFPUC	-80	-95
MW-CUP-18-490*	SFPUC	-135	-150
MW-CUP-18-660*	SFPUC	-180	-195
MW-CUP-19-180*	SFPUC	Dry Well	Dry Well
MW-CUP-19-475*	SFPUC	-150	-160
MW-CUP-19-600*	SFPUC	-185	-200
MW-CUP-19-690*	SFPUC	-185	-200
MW-CUP-22A-140*	SFPUC	Dry Well	Dry Well
MW-CUP-22A-290*	SFPUC	-120	-130
MW-CUP-22A-440*	SFPUC	-145	-160
MW-CUP-22A-545*	SFPUC	-190	-200
MW-CUP-23-230*	SFPUC	-115	-130
MW-CUP-23-440*	SFPUC	-150	-165
MW-CUP-23-515*	SFPUC	-195	-210
MW-CUP-23-600*	SFPUC	-190	-205
MW-CUP-36-160*	SFPUC	-545	-60
MW-CUP-36-270*	SFPUC	-95	-105
MW-CUP-36-455*	SFPUC	-195	-210
MW-CUP-36-585*	SFPUC	-210	-220
SSFLP-MW120*	SFPUC	-30	-40
SSFLP-MW220*	SFPUC	-45	-55
SSFLP-MW440*	SFPUC	-205	-220
SSFLP-MW520*	SFPUC	-210	-225
MW-CUP-44-1-190*	SFPUC	-25	-35
MW-CUP-44-1-300*	SFPUC	-40	-55
MW-CUP-44-1-460*	SFPUC	-225	-235
MW-CUP-44-1-580*	SFPUC	-225	-235
MW-CUP-M-1*	SFPUC	n/a	n/a

Notes: Wells with thresholds defined as a seawater intrusion monitoring well are shown in **bold**:
n/a: Not available. Triggers are to be developed at a later date for wells with limited data
* Dedicated Monitoring Well

Figure 4.1
Wells Monitored for Compliance with Groundwater Levels BMO



F:\5.1 - San Bruno\Figures\Figure 5.1 Compliance Wells GW Levels BMO.mxd, March 23, 2011

4.3.2 Maintain or Improve Groundwater Quality

Maintenance of groundwater quality includes management actions to prevent seawater intrusion as well as impacts of elevated nitrate levels.

4.3.2.1 Seawater Intrusion

While there has been no identified seawater intrusion in the production aquifer to date, the South Westside Basin is at risk for seawater intrusion as groundwater levels throughout the basin are below sea level. Monitoring wells have been installed and are being monitored for seawater intrusion indicators along the Pacific Ocean and along San Francisco Bay. As the monitoring network is not capable of monitoring for all potential seawater intrusion pathways, it is reasonable to expand the seawater intrusion monitoring to include production wells and other monitoring wells. Seawater intrusion indicators include chloride, a conservative constituent in seawater, as well as several ratios of ions that are impacted by ion exchange, dolomitization, adsorption, and other chemical processes as seawater first contacts aquifer materials in equilibrium with fresh water. The indicators include the following:

- Chloride: Chloride concentrations are the most common indicator of seawater intrusion. Chloride concentrations can increase rapidly as high-chloride seawater intrudes into low chloride water in the aquifer and are often the first indicator of seawater intrusion. Chloride can also be of other sources, such as sewage, agricultural return, or water in the soil from the time of formation.
- Chloride/Bromide Ratio: The chloride/bromide ratio can be used to distinguish seawater sources (ratio of approximately 297) from sewage (higher ratio), agriculture (lower ratio), and other sources.
- Sodium/Chloride Ratio: The sodium/chloride ratio can be used as an early indicator of seawater intrusion. Low ratios, lower than seawater (<0.56 weight ratio), can indicate seawater intrusion prior to significant increases in chloride concentrations. This is a result of cation exchange, as sodium replaces calcium on aquifer sediments. If seawater intrusion is in the early stages of progressing, the sodium/chloride ratio should decrease, with a resulting increase in the ratio of both calcium and magnesium to chloride.
- Calcium/Magnesium Ratio and Calcium/(Bicarbonate and Sulfate) Ratio: These ratios can also provide an early indication of seawater intrusion. Ratios greater than 1 can be an early indicator of seawater intrusion. This is a result of dolomitization, which increases calcium concentrations and reduces magnesium concentrations as calcium carbonate (e.g., calcite, limestone) transforms into calcium magnesium carbonate (e.g., dolomite) (Jones et al., 1999).

The approach is based on the level of available data. These ratios are used in other basins to study seawater intrusion, along with other ratios and stable isotope analyses. In the Central and West Coast Basins of Los Angeles County, chloride and TDS concentrations; ratios of chloride to bromide, iodide, and boron; isotopic data; age dating; and borehole data are used to assess saline groundwater (Land, et al., 2004). Seawater intrusion analysis in the Seaside Basin of Monterey County utilizes chloride concentrations, sodium/chloride ratios, other cation/anion ratios, geophysical logs, and analysis of groundwater levels (HydroMetrics, 2011). In the San Leandro and San Lorenzo areas of Alameda County, ratios of chloride to bromide, iodide, barium, and boron are used along with chloride concentrations, noble gasses and isotopic data to study seawater intrusion (Izbicki et al, 2003).

Annual monitoring will include pumping and static water level measurements and sampling for the following analytes:

Alkalinity	Ortho-phosphate	Calcium	Conductivity
Bromide	Sulfate	Magnesium	pH
Chloride	Total Dissolved Solids	Potassium	Total Bicarbonate
Nitrate	Boron	Sodium	Iron and Manganese

4.3.2.1.1 Triggers

With the exception of chloride, thresholds are not set for each indicator as the magnitude and timing of each requires analysis prior to making decisions on the status of the South Westside Basin. Chloride thresholds are necessary as the first signs of seawater intrusion need to be recognized rapidly to protect the overall water quality. Thresholds are set at approximately 10 percent above the historical maximum concentration over the past twenty years of sampling (1991 – 2010, with probable outliers removed). This allows for variability inherent in sampling and analytical testing, but will signal potential issues should concentrations increase. Additional information on seawater intrusion parameters for a selection of these wells is presented in Appendix E. Chloride thresholds for each well are presented in Table 4.2. Note that these thresholds are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the “CUP” wells. The well locations are shown in Figure 4.2. The SMCL for chloride is 250 mg/l (recommended), 500 mg/l (upper) and 600 mg/l (short-term).

Regular analysis of water quality and water level data will allow for identification of data gaps that may require installation of new monitoring wells at new locations and/or new depth intervals, geophysical testing, or more rigorous chemical and isotope analysis.

Table 4.2 Seawater Intrusion BMO Chloride Thresholds (mg/l)

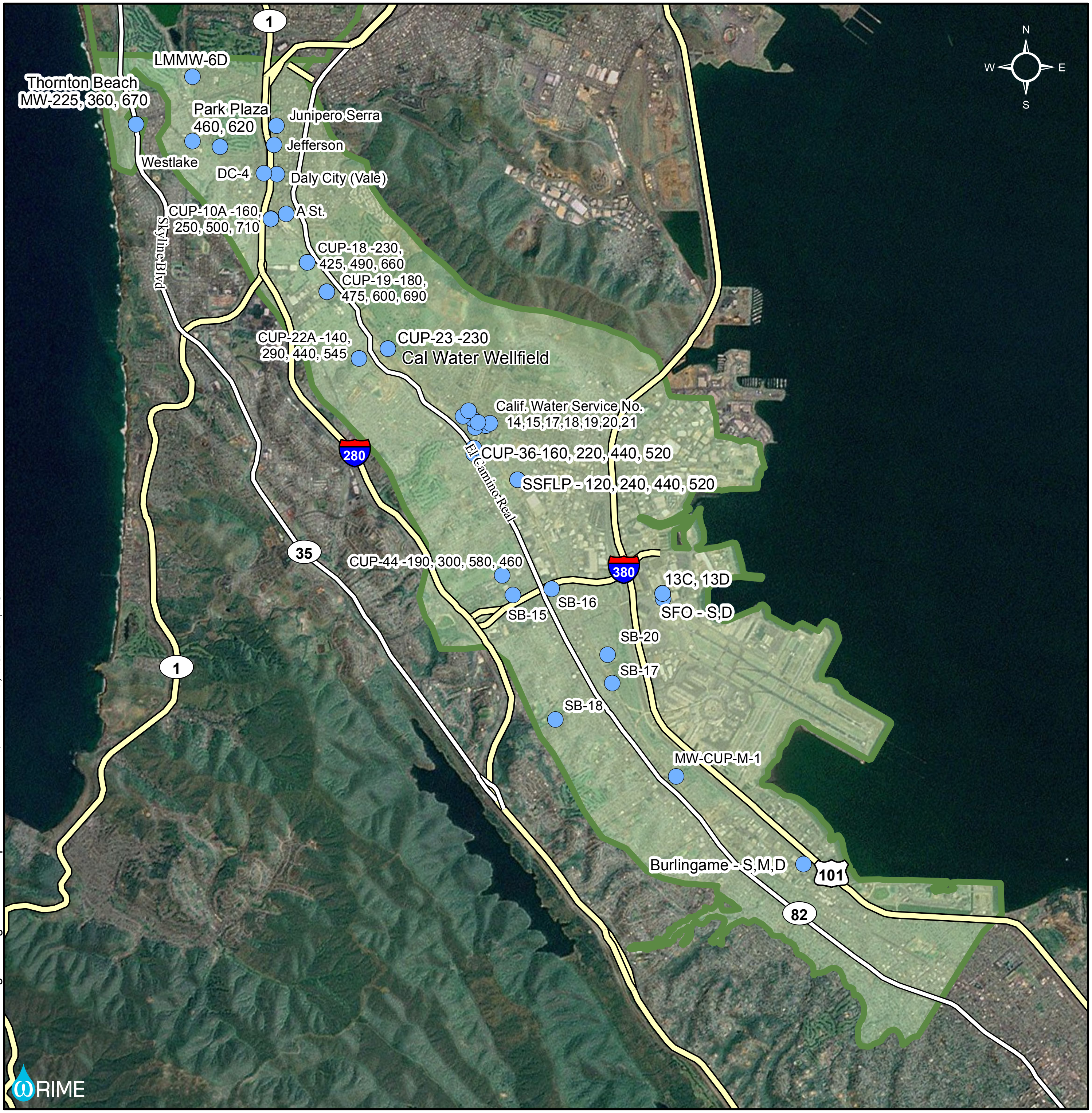
Well	Chloride Threshold	Recent Result	1991-2010 Maximum
Burlingame-S	570	430	518
Burlingame-M	90	63	79
Burlingame-D	55	41	47
SB-15	160	110	145
SB-16	170	110	154
SB-17	65	58	58
SB-18	80	70	72.5
SB-20	100	84	88
SSF 1-14	145	123	129
SSF 1-15	150	110	135
SSF 1-17	115	103	103
SSF 1-18	100	65	91
SSF 1-19	135	120	122
SSF 1-20	185	140	167
SSF 1-21	215	180	196
MW-CUP-M1	60	51	51
MW-CUP-10A-160	145	128	128
MW-CUP-10A-250	145	128	128
MW-CUP-18-230	100	90	90
MW-CUP-18-425	100	91	91
MW-CUP-18-490	100	90	90
MW-CUP-18-660	n/a	n/a	n/a
MW-CUP-19-180	n/a	n/a	n/a

MW-CUP-19-475	110	99	99
MW-CUP-19-600	105	95	95
MW-CUP-19-690	180	160	160
MW-CUP-22A-140	n/a	n/a	n/a
MW-CUP-22A-290	120	106	106
MW-CUP-22A-440	80	71	71
MW-CUP-22A-545	120	106	106
MW-CUP-23-230	n/a	n/a	n/a
MW-CUP-23-440	n/a	n/a	n/a
MW-CUP-23-515	n/a	n/a	n/a
MW-CUP-23-600	n/a	n/a	n/a
MW-CUP-36-160	125	110	110
MW-CUP-36-270	130	118	118
MW-CUP-36-455	90	81	81
MW-CUP-36-585	205	186	186
MW-CUP-44-1-190	80	69	69
MW-CUP-44-1-300	95	84	84
MW-CUP-44-1-460	150	134	134
MW-CUP-44-1-600	95	85	85
SSFLP-MW120	200	173	180
SSFLP-MW220	115	100	104
SSFLP-MW440	75	61	65
SSFLP-MW520*	125	107	110
Park Plaza MW 620*	175	143	155
Park Plaza MW 460	n/a	n/a	n/a
LMMW-6D	n/a	n/a	n/a

Thornton Beach MW 225	n/a	n/a	n/a
Thornton Beach MW 360	n/a	n/a	n/a
Thornton Beach MW 670	n/a	n/a	n/a
A-Street	165	88	150
Jefferson	135	58	120
Junipero Serra	55	50	50
Vale	80	67	71
No. 4 Citrus	85	61	76
Westlake	200	99	180
SFO-S	13,600	10,000	12,400
SFO-D	605	550	550

Note: n/a: Not available; triggers are to be developed at a later date for wells with limited data

Figure 4.2
Wells Monitored for Compliance with Groundwater Quality BMO



Legend

- Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

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4.3.2.1.2 Actions

If the trigger threshold is met, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, analysis of other seawater intrusion indicators including analytical results and water level measurements, potential impacts to groundwater users or the environment, and the most appropriate actions.

If confirmed, analysis should be initiated to determine if the elevated value is likely the result of seawater intrusion, upconing of deep saline water, or other sources. Actions will be based on plan elements defined in Section 5, Elements of the Groundwater Management Plan. These actions may include:

- Continued operation
- Increased monitoring
- Studies of sources of chloride (seawater intrusion or upconing from deeper sediments) and additional options to manage water quality
- Reoperation or new wells to move production to other parts of the basin or different depths
- Decreased production to reduce seawater intrusion or upwelling
- Substitution of alternate supplies

4.3.2.2 Nitrate

Elevated nitrate levels in portions of the basin have become an increasing concern over the past several years. Although concentrations have largely remained below MCLs, individual wells have shown sudden increases and trends suggest possible issues in the future. The source of nitrate in the basin has not been studied, but historical and current land use point to either previous agricultural land uses, including extensive cattle operations, or current urban and turf-grass uses. If trends continue, work may be needed to identify the source and to determine how the region could keep nitrate levels within desired levels, potentially through development of a salt and nutrient management plan or through other studies. .

4.3.2.2.1 Triggers

This section defines nitrate monitoring, triggers, and actions on a well-by-well basis. Monitoring is based on existing DPH data collection efforts and local sampling of monitoring wells. Trigger 1 is based on 80 percent of the MCL, 36 mg/l, and Trigger 2 is based on 90 percent of the MCL, 41 mg/l.

It should be noted that data presented in this section is representative of raw water quality. Raw water quality is different from the water served to customers, as water purveyors pump selectively from wells based on quality and provide blended water from both groundwater and surface water sources to maintain a safe water supply in compliance with state and federal regulations.

Future nitrate monitoring should proceed annually, unless trends or levels indicate a need for more frequent measurements.

4.3.2.2.2 Actions

If Trigger 1 is met for one or more wells, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, potential impacts to groundwater users or the environment, and the most appropriate actions, both immediate and upon Trigger 2 (if met). The Groundwater Task Force will consider the status of all wells, including the wells below the trigger threshold, the quantity and quality of other supply sources for blending, and will also consider water level data and other environmental and operational factors that could contribute to increases in nitrate concentrations. Actions will be based on the plan elements and programs defined in Section 5, Elements of the Groundwater Management Plan.

If Trigger 2 is met, the actions defined for Trigger 1 and any additional measures, actions, or mechanisms deemed necessary by the Groundwater Task Force will be implemented.

Historical estimates of nitrate concentrations and current groundwater quality BMO trigger status are shown in Table 4.3. Note that the triggers are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the "CUP" wells.

Table 4.3 Groundwater Quality BMO Triggers

Well	1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l)	Recent Nitrate (as NO3) Concentration (mg/l)	Trigger Status
Burlingame-S	< 1	ND	
Burlingame-M	ND	ND	
Burlingame-D	1	1	
SB-15	15	5	
SB-16	8	ND	
SB-17	6	5	
SB-18	7	7	
SB-20	7	1	
01-14	82	76	Trigger 2
01-15	32	18	
01-17	222	219	Trigger 2
01-18	85	76	Trigger 2
01-19	60	35	
01-20	104	4	
01-21	3	ND	
MW-CUP-M1	12	12	
MW-CUP-10A-160	35	35	
MW-CUP-10A-250	48	48	Trigger 2
MW-CUP-10A-500	36	36	Trigger 1
MW-CUP-10A-710			
MW-CUP-18-230	7	7	
MW-CUP-18-425	8	8	
MW-CUP-18-490	2	2	
MW-CUP-18-660			
MW-CUP-19-180			

Well	1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l)	Recent Nitrate (as NO3) Concentration (mg/l)	Trigger Status
MW-CUP-19-475	1	1	
MW-CUP-19-600	ND	ND	
MW-CUP-19-690	ND	ND	
MW-CUP-22A-140			
MW-CUP-22A-290	33	33	
MW-CUP-22A-440	1	1	
MW-CUP-22A-545	24	24	
MW-CUP-23-230			
MW-CUP-23-440			
MW-CUP-23-515			
MW-CUP-23-600			
MW-CUP-36-160	26	26	
MW-CUP-36-270	8	8	
MW-CUP-36-455	ND	ND	
MW-CUP-36-585	ND	ND	
MW-CUP-44-1-190	35	35	
MW-CUP-44-1-300	37	37	Trigger 1
MW-CUP-44-1-460	2	2	
MW-CUP-44-1-600	ND	ND	
SSFLP-MW120	ND	ND	
SSFLP-MW220	1	1	
SSFLP-MW440	ND	ND	
SSFLP-MW520*	ND	ND	
Park Plaza MW 620*	1	< 1	
Park Plaza MW 460*			
LMMW-6D			

Well	1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l)	Recent Nitrate (as NO3) Concentration (mg/l)	Trigger Status
A-Street	170	98	Trigger 2
Jefferson	31	10	
Vale	46	35	
No. 4 Citrus	71	63	Trigger 2
Westlake	61	33	
Junipero Serra	47	34	
SFO-S	8	ND	
SFO-D	ND	ND	

Note: Blanks: Triggers are to be developed at a later date for wells with limited data

4.3.3 Limit the Impact of Point Source Contamination

Point source contamination can also threaten water supplies in the South Westside Basin. Loss of a portion of the water supply due to point source contamination would require use of alternate supplies, which are limited. The point source contamination BMO seeks to coordinate with regulatory agencies to ensure potential impacts to water supplies and environmental receptors are fully incorporated into remedial actions and monitoring programs at contaminated sites. The BMO recognizes that clay layers only slow the migration of contaminants and that these contaminants, if not properly remediated, may reach the primary production aquifer at some concentration at some point in the future.

No quantitative thresholds are set for this BMO as there are numerous potential contaminants; however, a qualitative objective of limiting the impact of point source contamination is defined through identifying and protecting areas of basin recharge, ensuring rapid response to new detections of contaminants at any well, and fully cleaning up contaminated sites, including perched aquifer systems that eventually recharge the deeper aquifer used for water supplies. Full cleanup may be through remediation programs or natural processes. The following are actions to achieve this BMO:

- Use basin understanding and the existing Groundwater Model to identify important areas of basin recharge. Identify appropriate measures to protect those areas.
- Actively engage with regulatory agencies and potentially responsible parties on existing sites.

- Notify regulators of contamination issues in wells, even for low-level detections, to ensure discovery of new problems as quickly as possible.
- Coordinate with land use planners to ensure land uses are suitable for land overlying the aquifer.

4.3.4 EXPLORE NEED FOR LAND SUBSIDENCE MONITORING

The land subsidence BMO focuses on increased understanding of the possible problem through potential additional monitoring activities. There has been no evidence of historical land subsidence, even though water levels have declined significantly from pre-development levels. Land subsidence is most rapid immediately after the initial dewatering of sediments. Thus, land subsidence is not anticipated from sediments that have been historically dewatered. Should water levels decline in the future, it is unlikely that subsidence would occur as these materials are similar to those historically dewatered and would likely exhibit similar limited compressibility.

However, without any previous studies of subsidence, there is a potential that land subsidence may have occurred unnoticed or that deeper materials may behave differently. As such, there is a need to perform a subsidence study to assess the status of the subsidence in the South Westside Basin.

Interferometric synthetic aperture radar (InSAR) studies are included in the implementation of the plan. The results of the InSAR study may confirm that no land subsidence is occurring in the South Westside Basin, or could show the need for more formalized monitoring and development of quantitative BMOs, which may be established under the reporting and updating element contained in Section 5.7, Reporting and Updating.

4.3.5 MANAGE THE INTERACTION OF SURFACE WATER AND GROUNDWATER FOR THE BENEFIT OF GROUNDWATER AND SURFACE WATER QUANTITY AND QUALITY

This BMO seeks to manage changes in surface flow and surface water quality and quantity that directly affect groundwater levels or quality or are caused by groundwater production in the basin. As discussed in Section 2.3.10, there is little interaction between surface water and groundwater in the South Westside Basin. Colma Creek is the largest surface water feature, but it is relatively small and lined for most reaches. Other creeks are very small and drain local watersheds.

No quantitative thresholds are set for this BMO, however, the following qualitative objectives of maintaining or improving the interaction of surface water and groundwater are set:

- Maintain natural watercourses and investigate potential benefits of removing lining from watercourses where feasible.

- Maintain baseflow in creeks.
- Monitor groundwater levels to assist in water level studies at Lake Merced in San Francisco County in the North Westside Basin.

5 ELEMENTS OF THE GROUNDWATER MANAGEMENT PLAN

California Water Code section 10753.8 states that a GWMP may include components relating to all of the following:

- Control of saline water intrusion
- Identification and management of wellhead protection areas and recharge areas
- Regulation of migration of contaminated groundwater
- Administration of a well abandonment and well destruction program
- Mitigation of overdraft conditions
- Replenishment of groundwater extracted by water producers
- Monitoring of groundwater levels and storage
- Facilitation of conjunctive use operations
- Identification of well construction policies
- Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects
- Development of relationships with state and federal regulatory agencies
- Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination

These items are grouped and related back to the South Westside Basin GWMP goal and objectives in Table 5.1 and discussed in the following sections. Some of the items below call for consideration, evaluation, and the potential implementation of measures to address conditions in the groundwater basin. These items are intended to address goals and objectives of the GWMP, but do not propose specific actions or projects that might be developed on a case-by-case basis, as needed. Such specific actions or projects are not fully known at this time and may be subject to evaluation, including but not limited to environmental review, when and if proposed for implementation, and may require approval by regulatory agencies with jurisdiction over the proposed action following completion of any required environmental review.

Table 5.1
Summary of GWMP Objectives and Elements

Item	BMOs: Maintain Acceptable Groundwater Levels	BMOs: Maintain or Improve Groundwater Quality	BMOs: Limit the Impact of Point Source Contamination	BMOs: Explore the Need for Land Subsidence Monitoring	Manage Interaction of Surface Water And Groundwater
Stakeholder Involvement	✓	✓	✓	✓	✓
Monitoring and Management					
Monitoring of groundwater levels and storage	✓		✓		✓
Monitoring of groundwater quality		✓	✓		✓
Monitoring of inelastic land subsidence				✓	
Monitoring of surface water/groundwater interaction	✓	✓			✓
Groundwater Storage					
Mitigation of overdraft conditions	✓	✓			✓
Replenishment of groundwater extracted by water producers	✓	✓			✓
Facilitation of conjunctive use operations	✓	✓			✓
Groundwater Quality					
Control of saline water intrusion		✓		✓	✓
Identification and management of wellhead protection areas and recharge areas	✓	✓	✓	✓	✓
Regulation of migration of contaminated groundwater		✓	✓	✓	✓
Administration of a well abandonment and well destruction program		✓	✓	✓	✓
Identification of well construction policies		✓	✓	✓	✓
Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	✓	✓	✓	✓	✓
Coordinated Planning					
Development of relationships with state and federal regulatory agencies	✓	✓	✓	✓	✓
Coordination with IRWMP efforts	✓	✓	✓	✓	✓
Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination	✓	✓	✓		✓
Reporting and Updating	✓	✓	✓	✓	✓

5.1 STAKEHOLDER INVOLVEMENT

Ongoing stakeholder involvement is critical to successful implementation of the GWMP. Interested parties include agencies within and near the South Westside Basin, environmental interests, and individuals and companies that rely on the groundwater basin for water supply. Coordination with these groups is necessary to ensure that goals and objectives continue to be consistent with the desires of the community; that a full range of alternatives are considered along with potential adverse impacts; and that progress can be made toward meeting the goal and objectives.

Actions

A1. *Distribute the GWMP in an electronic format to all parties that have expressed interest in the plan, including all agencies within and bordering the basin.*

A2. *Hold Groundwater Task Force (see Section 6.1) meetings on a semi-annual basis to discuss ongoing groundwater management issues and activities. These discussions will include other agencies, thus enabling cooperation between public entities whose service areas or boundaries overlie the groundwater basin. Meetings will focus on progress towards meeting BMOs, implementation of projects in this plan, new or updated status on the condition of the groundwater basin, and new or updated plans or strategies.*

A3. *Continue outreach to private groundwater producers, notably cemeteries, to involve these stakeholders in the ongoing groundwater management process.*

A4. *Reorient the GWMP web site from its current plan-development focus to an implementation focus, highlighting implementation activities and soliciting public input.*

A5. *Present actions implemented by the agencies at public meetings of the respective councils.*

A6. *Provide public notice for any revisions to the GWMP.*

5.2 MONITORING AND MANAGEMENT

Elements pertaining to Monitoring and Management of the South Westside Basin relate to groundwater levels and storage; groundwater quality; inelastic land subsidence; and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping.

5.2.1 GROUNDWATER LEVELS AND STORAGE

The South Westside Basin needs additional groundwater level and quality monitoring to meet the objectives of this plan and the needs of the individual water agencies. Monitoring protocols are included in Appendix C. Coordination among the agencies is necessary to make existing and future monitoring as complete as possible with respects to spatial distribution and timing.

Figure 5.1 shows all wells in the South Westside Basin with static water level measured at least once in 2009. Water level data are taken regularly by the water agencies, but typically static water levels are only taken when pumps are not operating due to maintenance activities. There is no existing basin-wide static groundwater level monitoring program.

To the extent possible, groundwater level monitoring should continue at all wells that are currently or have recently been measured, as shown in Figure 5.1. Water levels should be measured minimally in the spring (April) and fall (October). Datalogging pressure transducers should be installed in selected wells to determine variability between readings, which may refine future timing of groundwater level measurements. Measurements should be taken when the well and, to the extent possible, nearby wells are not pumping, to represent static water levels. In addition to the measurement, the pumping status at the well and nearby wells should be noted and preserved in the database. Additional monitoring details are provided in Appendix C.

Groundwater level monitoring should be coordinated with the California Statewide Groundwater Elevation Monitoring (CASGEM) program, a statewide groundwater elevation monitoring program that is intended to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Daly City, CalWater, and San Bruno, through the South Westside Basin Voluntary Cooperative Groundwater Monitoring Association, are the monitoring entities for the portion of the South Westside Basin within their service area. Coordination with CASGEM should include consistent monitoring protocols between data provided to the CASGEM program and other data collected in the basin.

A key element of monitoring and management of groundwater levels and storage is the Groundwater Model. The Groundwater Model is used primarily to improve the understanding of the groundwater system, but also is useful for the following:

- Aggregating, organizing, and analyzing existing data
- Identifying data gaps
- Simulating impacts on groundwater levels and storage of various projects and of continuation of existing operations

The Groundwater Model is available for use by all interested stakeholders from Daly City. Output from the model may be used in GWMP implementation to ensure that projects are designed to meet the stated goal and objectives.

These activities result in a significant amount of data. Usage of a data management system, such as the existing HydroDMS, can assist in storing, accessing, and analyzing data across multiple agencies.

Figure 5.1
Wells Monitored for Groundwater Levels

F:\6.1 - San Bruno\Figures\Figure 6.1 CFigure 6.1 Mon Wells GW Levels.mxd, March 21, 2011

Actions

B1. *Implement a basin-wide semi-annual static water level measurement program that builds upon existing monitoring. The program should include the wells belonging to the retail water agencies. Other wells may be included if feasible.*

B2. *Use existing database structures with data from these databases imported into a central Data Management System (such as the existing HydroDMS) to facilitate data sharing between agencies.*

B3. *Coordinate among agencies to ensure that wells continue to be monitored to provide long-term records of water levels at specific locations, and to ensure a consistent and, to the extent feasible, complete dataset.*

B4. *Participate in the CASGEM program.*

5.2.2 GROUNDWATER QUALITY

Water quality monitoring is performed for Title 22 compliance by the water agencies. Figure 5.2 shows the locations of wells monitored for water quality at least once in the most recent 5-year period with available data from DPH (2006 – 2010) or other local monitoring activity. Monitoring protocols are contained in Appendix C. Additional water quality monitoring is needed to ensure sufficient data to define nitrate concentrations for use by the water quality BMOs in this GWMP.

Actions

C1. *Continue groundwater quality monitoring as needed to meet Title 22 requirements.*

C2. *Standardize data collection protocols and timing through coordination among agencies.*

C3. *Continue to use existing database structures, with data from these databases imported into a central Data Management System (such as the existing HydroDMS).*

C4. *Fill gaps in the water quality monitoring network through sampling additional existing or newly constructed monitoring wells.*

C5. *Coordinate with the USGS on its National Ambient Water Quality Assessment (NAWQA) program and GAMA program to potentially integrate its efforts with local monitoring efforts.*

C6. *Consider development of a Salt and Nutrient Management Plan to assist in permitting of future recycled water projects.*

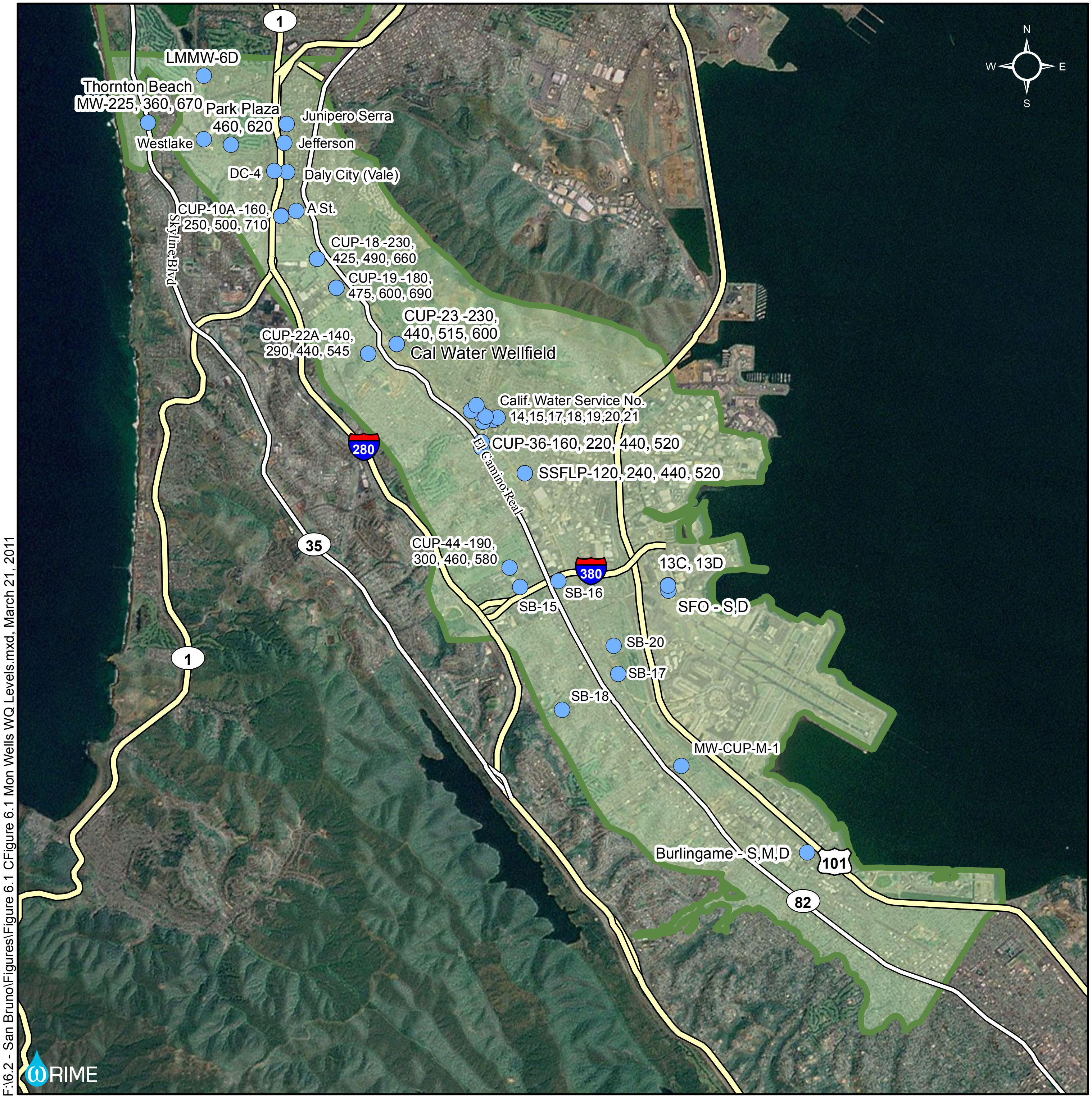

Figure 5.2
Wells Monitored for Groundwater Quality

F:\6.2 - San Bruno\Figures\Figure 6.1 CFigure 6.1 Mon Wells WQ Levels.mxd, March 21, 2011

5.2.3 INELASTIC LAND SUBSIDENCE

Monitoring land subsidence in the South Westside Basin is limited by the cost of traditional surveys and extensometer compared to the limited historical impact of subsidence in the basin. If land subsidence is reported in the area, or if water levels drop below historical lows, additional land subsidence monitoring will be considered. Relatively new technology, InSAR, allows for more cost-effective, regional scale land subsidence monitoring. Over time, these technologies are becoming more powerful and less expensive. Lower costs and opportunities to partner with others such as USGS may allow for land subsidence monitoring in the future.

Actions

D1. *Collect evidence, if any, of active inelastic land subsidence and assess the risk.*

D2. *Develop a land subsidence monitoring program, if needed, using InSAR or traditional surveying and extensometer methods.*

D3. *Partner with the USGS or nearby agencies to implement any needed monitoring.*

5.2.4 CHANGES IN SURFACE FLOW AND SURFACE WATER QUALITY THAT DIRECTLY AFFECT GROUNDWATER LEVELS OR QUALITY OR ARE CAUSED BY GROUNDWATER PUMPING

Surface flow within the South Westside Basin is minimal, primarily Colma Creek and other small creeks, as discussed in Section 2. However, Lake Merced is a significant water body with recreational uses to the north in the North Westside Basin. This GWMP intends to support the actions developed under the North Westside Basin GWMP through coordination with that plan during development and updates. The action listed below are reflective of the actions of the North Westside GWMP.

Action

E1. *Continue groundwater monitoring near Lake Merced to support ongoing studies.*

5.3 GROUNDWATER STORAGE

5.3.1 MITIGATION OF OVERDRAFT CONDITIONS

The South Westside Basin is currently considered not to be in a state of overdraft. Current pumping is estimated to be approximately at the basin yield, as estimated by the Westside Basin Groundwater-Flow Model (Hydrofocus, 2011). However, historical groundwater production has at times exceeded the basin yield, which has resulted in groundwater levels well below sea level. The groundwater level BMO is intended to serve as a prevention, coordination, and warning device.

Currently, the decisions and plans on groundwater production are made independently by each agency based on each agency's individual needs in coordination with the respective surface water supplies from the SFPUC. Under current basin management, there is little or no coordination among the agencies on the individual agency or total production from the basin. To manage the basin in a more robust and sustainable manner, there is a need to coordinate groundwater production among the agencies, along with appropriate level of monitoring and reporting of groundwater production, levels, and quality. This information can be used in several aspects of basin management, including:

- Keeping the Westside Basin Groundwater-Flow Model updated and using the model to evaluate the impact of collective production in comparison to the basin yield. In addition to investigating basin-wide conditions, the model can also provide details on the impact of the geographic distribution of production throughout the basin, so as to assist in managing the basin in a more sustainable manner. While more detailed analyses typically have higher uncertainties than regional analyses, they can provide information on estimated changes in the basin operations that can assist in groundwater management strategies.
- Updating the basin yield estimates over time as better data becomes available, and as operation of the basin evolves into a more coordinated manner. As a result, and in order to address any potential basin yield issues, there may be a need in the future to evaluate additional recharge opportunities or apportion production to each agency through voluntary agreements to assist in meeting groundwater level BMOs. Appropriate monitoring and robust modeling tools will assist in evaluating basin management options and safe yield should that become necessary in the future.

Actions

F1. *Should groundwater levels decline, analyze conditions to determine if the South Westside Basin is in overdraft or if conditions are due to short-term climatic variability or other factors. Analysis will include the use of the most up-to-date groundwater model.*

F2. *Should overdraft conditions occur, actions may include demand reduction through alternate supplies or conservation programs and increased recharge activities through in-lieu or direct recharge.*

F3. *Implement a voluntary groundwater pumping metering program for private wells, such as at golf courses or cemeteries, to improve overall basin understanding.*

F4. *Utilize the groundwater model to simulate the collective impacts of current, near-term, and long-term projected groundwater production*

F5. *If current or future production is considered beyond the basin yield and is anticipated to result in not meeting the Groundwater Level BMO, voluntarily apportionment of pumping to each agency may be performed to provide certainty on future levels of production. The apportionment will be determined by the water agencies at that time, but should consider historical production, access to* *alternate sources, status of existing infrastructure, water quality considerations, and projected needs.*

5.3.2 REPLENISHMENT OF GROUNDWATER EXTRACTED BY WATER PRODUCERS

Groundwater replenishment may take place to cost effectively increase stored water in the aquifer for normal and drought periods or to support regional water supply goals. As long as the South Westside Basin remains in a hydrologically balanced condition, replenishment will occur on a voluntary basis, as economically feasible projects and water sources become available.

Actions

Study the feasibility of and potential for implementing the following replenishment activities:

G1. *Direct recharge of storm water and other surface water, selecting replenishment water to best manage the quality of recharge waters and receiving waters*

G2. *Substitution of other water supplies such as recycled water or imported water for groundwater*

G3. *Conservation efforts*

G4. *Study the suitability of near surface conditions for improved recharge from low impact development techniques such as permeable pavement, swales, and others. Study should include subsurface materials and perched groundwater conditions.*

G5. *Should the basin become overdrafted for extended periods of time, appropriate actions for replenishment should be taken with proper governance structures.*

5.3.3 FACILITATION OF CONJUNCTIVE USE OPERATIONS

Conjunctive use operations can assist groundwater basin management as the agencies have access to both groundwater and surface water supplies. Conjunctive use in the South Westside Basin in the form of large-scale direct recharge through spreading basins may not be cost-effective due to high land costs and clay layers in the upper aquifer system, but potential options should be studied if identified. Conjunctive use could more likely take the form of in-lieu recharge, in which other supply sources, such as imports or recycled water, may replace groundwater, thus offsetting future groundwater pumping during times of reduced imported water supplies. Injection of water into the aquifer may also be considered. Consideration should be given to water quality changes that may occur due to recharge activities and the increase in groundwater levels, particularly with the potential mobilization of nitrate in the subsurface.

Actions

H1. *Consider the development, implementation, and maintenance of programs and projects to recharge aquifers. Programs may be local or regional in scope. These may use imported water, recycled* *water, and other waters to offset existing and future groundwater pumping, except in the following situations:*

- *Groundwater quality would be reduced, unless lower water quality provides maximum benefit*
- *Available groundwater aquifers are full*
- *Rising water tables threaten the stability of existing structures*

H2. *Support regional groundwater banking operations that are beneficial to the South Westside Basin and the region and support the goals of this GWMP.*

5.4 GROUNDWATER QUALITY

5.4.1 CONTROL OF SEAWATER INTRUSION

The threat of seawater intrusion in the South Westside Basin includes the potential migration of seawater from the Pacific Ocean and San Francisco Bay. Control of this migration includes monitoring groundwater levels, groundwater quality, and groundwater production. Should monitoring indicate increased risk of seawater intrusion, actions should be evaluated that would raise groundwater levels through increased recharge or decreased extraction.

Actions

I1. *Continue monitoring for seawater intrusion at the margins of the basin. Study the need for additional monitoring locations or inclusion of additional indicators or triggers.*

I2. *Combine seawater intrusion monitoring results with monitoring of basin-wide groundwater levels, groundwater quality, and production to fully determine risk of seawater intrusion.*

I3. *Evaluate the reduction of the gradient between sea level and groundwater levels through increased recharge or decreased production in the affected area.*

5.4.2 IDENTIFICATION AND MANAGEMENT OF WELLHEAD PROTECTION AREAS AND RECHARGE AREAS

The entire South Westside Basin is a source of recharge and requires protection to ensure high quality recharge and to maintain or enhance existing recharge quantities. Pervious areas such as open spaces and the numerous parks, cemeteries, and golf courses allow water to percolate into the soil and recharge the aquifer. No significant land use changes are anticipated in the built-out South Westside Basin, and these pervious areas are unlikely to be paved or otherwise developed. However, if such actions are considered in the future, the impact to the groundwater basin should be studied. Additionally, opportunities to increase pervious areas should be explored.

Drinking water source assessments produced by the groundwater agencies have identified uses that threaten groundwater quality in the South Westside Basin along with delineation of capture zones around wells. Uses that threaten some wells in the basin include:

- Automobile repair shops
- Automobile gas stations
- Dry cleaners
- Military installations
- Sewer collection systems
- Underground storage tanks - confirmed leaking tanks
- Utility stations - maintenance areas

Actions

J1. *Preserve and protect, to the extent possible, aquifer recharge areas.*

J2. *Implement public outreach efforts.*

J3. *Design recharge facilities to minimize pollutant discharge into storm drainage systems, natural drainage, and aquifers.*

J4. *Decrease storm water runoff, where feasible, by reducing paving in development areas, and by using design practices such as permeable parking bays and porous parking lots with beamed storage areas for rainwater detention. Exercise caution to avoid contamination from oil, gas, and other surface chemicals.*

J5. *Manage streams with natural approaches, to the maximum extent possible, where groundwater recharge is likely to occur.*

J6. *Identify prime recharge areas and consider offering incentives to landowners in exchange for limiting their ability to develop their property due to its retention as a natural groundwater recharge area. These incentives will encourage the preservation of natural water courses without creating undue hardship on the property owners, and might include density transfer functions.*

J7. *Submit the map of recharge areas (Figure 2.10) to local planning agencies and notify DWR and other interested persons when the map is submitted to those local planning agencies, as required by AB359 (Huffman)*

5.4.3 Regulation of the Migration of Contaminated Groundwater

It is important to regulate contaminated groundwater migration both for protecting existing sources of groundwater and for developing new sources of groundwater. Coordination with regulatory agencies and potentially responsible parties will give water managers input into the cleanup and containment of contaminated sites and will improve long-term planning efforts based on the predicted impact of those hazards. Additionally, new, improved, and more cost-effective treatment technologies can potentially result in additional potable or non-potable supplies from groundwater that was previously considered unavailable for use.

Action

K1. *Coordinate with local regulatory agencies to share information about contaminated sites and about the South Westside Basin groundwater system and wells. Treatment systems will be investigated as new non-potable supply sources.*

K2. *Coordinate with the SWRCB to verify the classification of contaminated media at sites within the basin in their GeoTracker website.*

5.4.4 Administration of a Well Abandonment and Well Destruction Program

Abandoned or poorly constructed wells should be properly destroyed to prevent migration of contaminants down well bores from the surface to the aquifer or across clay layers within the aquifer. Well destruction in the basin is administered by San Mateo County's Groundwater Protection Program (GPP). Destruction of wells is performed in accordance with the procedures set forth in DWR's *California Well Standards*, Bulletin 74-90 (1990).

Actions

L1. *Survey abandoned wells in the South Westside Basin both physically and from county records.*

L2. *Coordinate with San Mateo County's Groundwater Protection Program on destruction standards and procedures, as well as on logging of status of abandoned and destroyed wells.*

L3. *Encourage and, if feasible, provide funding for the destruction of abandoned wells.*

5.4.5 Identification of Well Construction Policies

Well construction in the South Westside Basin also is administered by San Mateo County's Groundwater Protection Program.

San Mateo County's Groundwater Protection Program issues permits for the construction or abandonment of all water wells including, but not limited to driven wells, monitoring wells, cathodic wells, extraction wells, agricultural wells, and community water supply wells. The wells are inspected during different stages of construction to verify standards are met. All drinking water wells are evaluated once installation is complete to ensure compliance with California Well Standards set forth in DWR's *California Well Standards*, Bulletin 74-90 (1990) and minimum drinking water standards.

Actions

M1. *Coordinate with San Mateo County's Groundwater Protection Program staff to ensure all parties are aware of local and regional contamination plumes. Increased caution or restrictions may be necessary near these plumes.*

5.5 CONSTRUCTION AND OPERATION BY THE LOCAL AGENCY OF GROUNDWATER CONTAMINATION CLEANUP, RECHARGE, STORAGE, CONSERVATION, WATER RECYCLING, AND EXTRACTION PROJECTS

Properly designed, constructed, and operated projects can cost-effectively move the South Westside Basin towards meeting water quantity, water quality, and subsidence objectives.

These projects could include:

- Groundwater contamination cleanup

Actions

N1. *Remediate basin groundwater from point-source (e.g., TCE, fuels) and non-point-source (e.g., nitrate) contamination, in a cost-effective manner. Point-source cleanup activities will include interfacing with regulatory agencies, potentially responsible parties, and other nearby agencies and municipalities. These actions will seek to return the contaminated area, to the extent possible, to a water supply source. Cleanup activities will be performed by the potentially responsible parties, and the regulatory agencies. Payment for impacts to the water system, if any, will be sought from the potentially responsible parties.*

- Recharge

Actions

N2. *Evaluate and consider the construction and operation of projects to recharge good-quality surplus water to the groundwater basin. Recharge water may include storm water, surface water, recycled water, or imported water and will be captured through existing pumping facilities. Recharge water would be selected to mutually benefit groundwater quantity and quality. It is not anticipated that additional facilities will be needed to extract stored water. Facilities are anticipated to be small in scale, rather than large spreading basins that are not cost-effective in the urbanized South Westside Basin.*

- Storage – Additional surface storage, while beneficial, is not anticipated in the area beyond small scale water harvesting and detention basins.
- Conservation – Conservation is a key part of water demand management in the South Westside Basin, exhibited by already low per-capita water use. CalWater and Millbrae are signatories to the MOU of the California Urban Water Conservation Council and participate in demand-side management measures. These agencies have committed to implementing best management practices to reduce water demand.

Actions

N3. *Agencies should work to build upon already successful conservation efforts by considering signing the MOU and participating in the California Urban Water Conservation Council, or implementing equivalent local efforts.*

N4. *Encourage installation of water-conserving systems such as dry wells and gray water systems where feasible, especially in new construction. Also encourage installation of rain gardens, cisterns, or infiltrators to capture rainwater from roofs for irrigation in the dry season and flood control during heavy storms.*

N5. *Support outreach programs to promote water conservation and widespread use of water saving technologies.*

N6. *Encourage continued outdoor irrigation water conservation.*

- Water recycling – Recycled water is available from Daly City's tertiary treatment plant. Other treatment plants could potentially provide recycled water in the future.

Actions

N7. *Evaluate and consider the expansion of existing recycled water programs, including efforts to utilize effluent from other treatment plants in the basin. Significant opportunities are available for usage of tertiary recycled water at the cemeteries, if appropriate funding mechanisms can be developed.*

- Extraction – Continued groundwater extraction will likely be necessary to meet future demand.

Actions

N8. *Perform groundwater modeling during the planning stages to ensure there are no significant impacts from new wells.*

5.6 COORDINATED PLANNING

5.6.1 DEVELOPMENT OF RELATIONSHIPS WITH STATE AND FEDERAL REGULATORY AGENCIES

Federal and state regulatory agencies to develop of relationships with include the following:

- Federal
  - EPA – contaminated sites
  - USGS – aquifer and watershed conditions, groundwater and surface water monitoring
- State
  - DPH – drinking water quality and vulnerability
  - DTSC – contaminated sites
  - DWR – aquifer conditions

- RWQCB – surface water quality and groundwater quality, permitting
- Water Board – groundwater monitoring (GAMA)

Actions

O1. *Coordinate with these federal and state agencies on issues related to monitoring and contaminated sites as well as on opportunities for grant funding.*

5.6.2 COORDINATION WITH IRWMP EFFORTS

As noted in Section 1, Introduction and Background, the Plan Area is part of the Bay Area IRWMP. Coordination during implementation of the GWMP with these IRWMP efforts is important to ensure that local efforts help meet regional goals and vice-versa.

Action

P1. *Ensure that at least one member of the Groundwater Task Force is actively involved in the coordination of both the IRWMP and the GWMP. This member will provide dialogue between the two efforts.*

5.6.3 REVIEW OF LAND USE PLANS AND COORDINATION WITH LAND USE PLANNING AGENCIES TO ASSESS ACTIVITIES THAT CREATE A REASONABLE RISK OF GROUNDWATER CONTAMINATION

As discussed in Section 5.4.2, Identification and Management of Wellhead Protection Areas and Recharge Areas, certain land uses and activities can potentially impact groundwater quality. Avoiding these uses in recharge areas and near wells is a better strategy than mitigation once the land uses are already in place.

Actions

Q1. *Coordinate between stakeholders and land use planning agencies to encourage protection of the groundwater resource by limiting activities that create an unreasonable risk to groundwater. Maps of well locations with soil properties will be provided to assist land use planning agencies in their decision process.*

Q2. *Monitor environmental impact reports and comment on such reports to ensure the water resources are protected.*

Q3. *Involve water agencies through water supply assessments as required under SB 610. The water supply assessment documents water supply sufficiency by identifying sources of water supply, quantifying water demands, evaluating drought impacts, and providing a comparison of water supply and demand.*

5.7 REPORTING AND UPDATING

Reporting on the status of the GWMP implementation is important for the fulfillment of the actions and projects listed in the plan. Updating the plan is important to reflect changing conditions and understanding of the basin.

Actions

R1. *Report on the GWMP's implementation progress every 2 years; include details on monitoring activities, trigger status of BMOs, project implementation, and new or unresolved issues. Post reports and status tables or maps for BMOs on the Internet.*

R2. *Update the GWMP every 5 years, unless changes in conditions in the basin warrant updates on a different frequency. Updates will be limited to those sections that require updating. Notify the public of the update and develop the update with input from the public and the Groundwater Task Force.*

6 IMPLEMENTATION

6.1 GOVERNANCE

The current governance of the South Westside Basin is based on the individual interest model. Under the individual interest model, stakeholders govern and develop water resource projects individually. The individual interest model will be retained with representatives from each stakeholder eligible for participation in the Groundwater Task Force. Individual development of projects will be designed and implemented following the common goal, objectives, and elements described in this GWMP, and will be presented to the Task Force for informational and coordination purposes. Additionally, coordination between stakeholders will allow for easier implementation of projects spanning multiple jurisdictions or benefitting multiple jurisdictions. As a potential next step, the governance structure may be defined in a MOU, which may be developed and signed after the adoption of this GWMP. The primary feature of the governance of the South Westside Basin would be the South Westside Basin Groundwater Task Force (Groundwater Task Force), which would lead the implementation of this GWMP.

6.1.1 Roles and Responsibilities

The Groundwater Task Force will

- Guide the implementation of the GWMP
    - Discuss and advance regional and local groundwater projects such as
        - Conjunctive use
        - Stormwater capture
        - Alternate supplies, such as recycled water
    - Coordinate on monitoring and CASGEM compliance
    - Coordinate on groundwater modeling and data management
    - Coordinate with larger regional efforts such as the Bay Area IRWMP
    - Coordinate on grant and loan opportunities
    - Develop reporting for GWMP implementation
- Share hydrogeological and operational information with others, such as
    - Groundwater levels
    - Groundwater quality
    - Well performance
- Provide a forum for public interaction on groundwater issues
- Provide a basis for future governance, if needed

6.1.2 Membership and Participation

Membership in the Groundwater Task Force is anticipated to include representatives from San Bruno, Daly City, California Water Service Company, and SFPUC as well as other major stakeholders, as follows in alphabetical order:

- Agricultural representative
- BAWSCA
- California Water Service Company
- Cemetery representative
- Town of Colma
- City of Daly City
- Environmental representative
- Golf Course representative
- Public representative
- Representative for cities not using groundwater (Millbrae and Burlingame)
- City of San Bruno
- San Francisco Public Utilities Commission
- San Mateo County

Changes to the composition of the Groundwater Task Force may be made with unanimous consent of the signatories to the potential MOU and a majority of all members attending the meeting.

Other entities are also encouraged to attend the meetings, including City of South San Francisco, RWQCB, United Airlines, and other interested groups or individuals. Participation by these groups in the meetings should be encouraged to allow for transfer of knowledge and a unified implementation of groundwater management.

6.1.3 Administration

A Groundwater Task Force administrator is needed to provide leadership to maintain progress and meet the implementation goals of the GWMP. The potential MOU may establish the initial administrator and a procedure to change the administrator from time-to-time. The administrator must have adopted this GWMP. Responsibilities of the administrator include:

- Scheduling regular meetings
- Providing agendas and minutes
- Monitoring or directing the monitoring of progress towards meeting implementation goals
- Developing or directing the development of annual reports
- Updating the GWMP as necessary

6.1.4 MEETINGS

Groundwater Task Force meetings would provide a forum for representatives from stakeholder groups to discuss and resolve regional groundwater issues. The meetings would be at least twice a year and open to the public.

The meetings would be intended to allow for the sharing of information as well as for the development of programs or projects needed to implement the GWMP. Information sharing may include changes to water supply infrastructure, new monitoring data, or new problems or opportunities. New programs and projects may be developed and implemented by individual stakeholders, by groups of stakeholders, or by all stakeholders. The ultimate project-making authority remains within the entity sponsoring the project.

6.1.5 VOTING

The representatives on the Groundwater Task Force would coordinate on matters relevant to groundwater management in the South Westside Basin, using the goal, objectives, and elements of this GWMP to guide their decisions. Some occasions may require a formal vote by the Groundwater Task Force, specifically for the following:

- Changing of the composition of the Groundwater Task Force
- Changes to the MOU

Decisions to change the composition of the group would require unanimous support among the signatories to the potential MOU and would require majority support among all members attending the meeting to move forward. Decisions of the group to change the MOU must be unanimous among the MOU signatories to move forward. Projects may move forward with the support of a subset of the group, but would do so outside of the auspices of the Groundwater Task Force.

6.1.6 POTENTIAL FUTURE GOVERNANCE

If deemed necessary by the Groundwater Task Force, a MOU may be signed to create a more formalized governance structure. It is not anticipated at this time that future needs would require a more structured management system through a JPA.

Advantages to the individual interest approach in this Plan and through the potential MOU include the following:

- Agencies can focus their resources on projects specific to their needs
- No loss of management control by local groundwater resources
- Ease of implementation because it is a continuation of the current approach to groundwater management in the region.

Moving to a mutual interest model based on a JPA could provide the following:

- Ease pursuing regional projects that would benefit the entire South Westside Basin
- Define who coordinates projects and what role each agency plays during regional project planning, construction, operation, and maintenance
- Generate economies of scale for large projects
- Increase likelihood of state funding for projects benefiting multiple entities
- Prevent individual stakeholders from undertaking actions not complementary to the BMOs.
- Improved framework for resolution of conflicts.

Any potential future need to develop a MOU or JPA would be discussed through the Groundwater Task Force.

6.2 DISPUTE RESOLUTION

Disputes relating to implementation of the GWMP will be resolved by the Groundwater Task Force. In the event that the Groundwater Task Force cannot resolve the dispute, an outside neutral third party will assist the parties in working towards a satisfactory resolution, with completion of all procedures within 60 to 90 days, unless the parties to the dispute agree to a longer timeframe. Costs incurred, if any, in this process will be equally shared by the involved parties.

6.3 FINANCING AND BUDGET

Financing of projects will be on a project-by-project basis and will be the responsibility of the sponsoring agency or group, unless other agreements are made. Financing for the reporting and updating of the GWMP will be shared among the GWMP participants, with details to be mutually agreed upon.

It is anticipated that SFPUC will, at their discretion, continue providing for the development of annual reports for the entire South Westside Basin, with support from the GWMP participants for data and review. Additional items not currently included in SFPUC's annual reports but required by this GWMP may require a funding agreement from the water agencies adopting and agreeing to this GWMP.

6.4 SCHEDULE

The following schedule highlights the key milestones for implementation of the Groundwater Management Plan.

Item	*Reference Section*	*Initial Completion*	*Recurrence*
Meet with stakeholders to define and consider adoption of a governance structure	***6.1***	***2 years***	***n/a***
Implement basinwide semiannual static groundwater level monitoring	***4.3.1, 5.2.1, App. C***	***1 year***	***n/a***
Add additional pressure transducers to existing groundwater level monitoring network	***5.2.1 App. C***	***2 year***	***n/a***
Implement a voluntary groundwater level monitoring program for private groundwater producers	***App. C***	***2 years***	***n/a***
Develop program to survey and destroy abandoned wells	***5.4.4***	***3 years***	***n/a***
Implement a voluntary groundwater production monitoring program for private groundwater producers	***App. C***	***3 years***	***n/a***
Identify recharge strategies to increase yield	***2.3.5, 5.3.1 5.3.2 5.3.3 5.4.1 5.4.2 5.5 5.6.3***	***2 years***	***As needed***
Update Groundwater Model	***4.3.1***	***1 years***	***1 year***
Complete subsidence analysis using InSAR	***4.3.4***	***5 years***	***As needed***
Continue public outreach and education	***5.1***	***2 years***	***Ongoing***
Report on GWMP	***5.7***	***2 years***	***1 year***
Update GWMP	***5.7***	***5 year***	***5 years***

7 REFERENCES

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APPENDIX A – PUBLIC PROCESS

RESOLUTION NO. 2010 – 74

A RESOLUTION OF INTENT TO DRAFT A GROUNDWATER MANAGEMENT PLAN FOR THE SOUTH WESTSIDE GROUNDWATER BASIN

WHEREAS, the City of San Bruno ("City") is a general law municipality and municipal corporation that provides water service to a portion of the South Westside Basin ("Basin"), a basin which is not subject to groundwater management pursuant to other provisions of law or a court order, judgment of decree; and

WHEREAS, the South Westside Basin is a critical resource for San Mateo and San Francisco Counties as a local water resource that augments imported water from the Tuolumne River and increases the reliability of local water supplies; and

WHEREAS, in 1992, the California Legislature enacted Assembly Bill 3030 to provide local public agencies increased management authority over their groundwater resources and subsequently enacted Senate Bill 1938 to encourage local public agencies to adopt groundwater management plans in order to increase their eligibility for grant funds for groundwater related projects (Water Code Section 10750); and

WHEREAS, the Legislature has also declared that the additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in the State; and

WHEREAS, the adoption of a groundwater management plan is encouraged, but not required, by law; and

WHEREAS, the City received a Local Groundwater Assistance Fund Grant in the amount of $209,908 from the California Department of Water Resources, pursuant to the Water Security, Clean Drinking Water, costal Beach Protection Act of 2002 (Water Code Section 79560 et seq.) to fund a groundwater management plan for the South Westside Basin; and

WHEREAS, prior to adopting a resolution of intent to draft a groundwater management plan, Water Code Section 10753.2 requires a local agency to hold a public hearing, after publication of notice pursuant to Government Code Section 6066 on whether or not to adopt a resolution of intent to draft a groundwater management plan; and

WHEREAS, pursuant to Government Code 6066, the City duly published notice of a public hearing before the City Council on whether or not to adopt a resolution of intent to draft a groundwater management plan:

NOW, THEREORE, BE IT RESOLVED by the city Council of the City of San Bruno as follows:

1. To adopt a resolution of intent to draft a groundwater management plan for the South Westside Basin in accordance with the provisions of Water Code Sections 10750 *et seq.*
2. Direct the City Clerk to publish the Resolution of Intent under Government Code Section 6066 pursuant to Water Code Section 10753.3(a)
3. Direct Staff to prepare a groundwater management plan for the South Westside Basin in accordance with Water Code Sections 10750 *et seq.*

---oOo---

I hereby certify that foregoing **Resolution No. 2010 - 74** was introduced and adopted by the San Bruno City Council at a regular meeting on August 24, 2010, by the following vote following vote:

AYES: Councilmembers: Ibarra, Medina, O'Connell, Salazar, Mayor Ruane

NOES: Councilmembers: None

ABSENT: Councilmembers: None

Vicky S. Hasha

Vicky S. Hasha, Deputy City Clerk

CITY OF SAN BRUNO
INCORPORATED DEC. 23RD 1914
SAN MATEO CO CAL

I hereby certify this to be a full, true and correct copy of the document it puports to be, the original of which is on file in my office.

Dated: September 2, 2010

Vicky S. Hasha Deputy City Clerk

City Clerk of the City of San Bruno

San Mateo County Times

c/o Bay Area News Group-East Bay, Legal Advertising
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San Mateo, CA 94402
Legal Advertising
(800) 595-9595 opt.4

San Bruno, City of/Engineering
Scott Munns,567 El Camino Real
San Bruno CA 94066

PROOF OF PUBLICATION

FILE NO. Groundwater Plan

In the matter of

The undersigned deposes that he/she is the Public Notice Advertising Clerk of the SAN MATEO COUNTY TIMES, a newspaper of general circulation as defined by Government Code Section 6000, adjudicated as such by the Superior Court of the State of California, County of San Mateo (Order Nos. 55795 on September 21, 1951), which is published and circulated in said county and state daily (Sunday excepted).

The PUBLIC NOTICE

was published in every issue of the SAN MATEO COUNTY TIMES on the following date(s):
8/10/2010, 8/17/2010

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Public Notice Advertising Clerk

Legal No. **0003613375**

Notice of Public Hearing Groundwater Management Plan

NOTICE IS HEREBY GIVEN that at 7:00 p.m. on August 24, 2010 in the City of San Bruno Senior Center at 1555 Crystal Springs Road, San Bruno, California, the City of San Bruno will hold a public hearing on whether or not to adopt a resolution of intent to draft a groundwater management plan for the South Westside Basin (Plan) pursuant to California Water Code section 10750 et seq. for the purposes of developing the Plan and establishing a groundwater management program.

Members of the public, including land owners, are invited to attend the hearing. Draft copies of the proposed resolution of intent to draft a groundwater management plan will be available for review by the public at the hearing or may be obtained at San Bruno City Hall, Department of Public Services, 567 El Camino Real, San Bruno, California. Opportunity for public comment and input will be provided at the hearing. In accordance with Water Code section 10753.4(b), interested parties who wish to participate in developing the groundwater management plan may do so by attending the hearing and expressing their interest, or by submitting a written request to participate, to the attention of Will Anderson, Project Manager, City of San Bruno, Public Services Department, 567 El Camino Real, San Bruno, CA 94066.

The City of San Bruno wishes to make all of its public hearings accessible to the public. Upon request, the proposed resolution of intent document will be made available in appropriate formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the City of San Bruno, Public Services Department at 650-616-7065 at least 72 hours before the meeting, if possible.

The public is invited to attend and comment in the process described above. Written comments may be submitted to the City of San Bruno for inclusion in the public record. Any person unable to attend the public hearing may submit written comments to City of San Bruno, Office of the City Clerk, 567 El Camino Real, San Bruno, CA 94066. If you have questions regarding this notice or the matter to be heard, please contact Will Anderson at (650) 616-7065. In addition, a website has been established as an information source throughout the development process of the groundwater management plan at http://www.southwestsideplan.com.

SMCT #3613375
Aug. 10, 17, 2010

RECEIVED
City of San Bruno
AUG 23 2010
Dept. of Public Works
Engineering

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San Bruno CA 94066

PROOF OF PUBLICATION

FILE NO. J. Shapona

In the matter of

San Mateo County Times

The undersigned deposes that he/she is the Public Notice Advertising Clerk of the SAN MATEO COUNTY TIMES, a newspaper of general circulation as defined by Government Code Section 6000, adjudicated as such by the Superior Court of the State of California, County of San Mateo (Order Nos. 55795 on September 21, 1951), which is published and circulated in said county and state daily (Sunday excepted).

The PUBLIC NOTICE

was published in every issue of the SAN MATEO COUNTY TIMES on the following date(s):

6/24/2012, 7/1/2012

RECEIVED
City of San Bruno

JUL 09 2012

Dept. of Public Works
Engineering

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: July 2, 2012

Public Notice Advertising Clerk

Legal No. **0004476932**

Notice of Public Hearing
Groundwater Management Plan

NOTICE IS HEREBY GIVEN that at 7:00 p.m. on July 10, 2012 in the City of San Bruno Senior Center at 1555 Crystal Springs Road, San Bruno, California, the City of San Bruno will hold a public hearing on whether or not to adopt a groundwater management plan for the South Westside Basin (Plan) pursuant to California Water Code section 10750 et seq. for the purposes of adopting the Plan and establishing a groundwater management program.

Members of the public, including land owners, are invited to attend the hearing. Draft copies of the proposed Plan will be available for review by the public at the hearing or may be obtained at San Bruno City Hall, Department of Public Services, 567 El Camino Real, San Bruno, California. Opportunity for public comment and input will be provided at the hearing. The Plan includes basin management objectives, the monitoring and management of groundwater levels and groundwater quality degradation, inelastic land surface subsidence, changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin, and a description of how recharge areas identified in the Plan substantially contribute to the replenishment of the groundwater basin.

The City of San Bruno wishes to make all of its public hearings accessible to the public. Upon request, the proposed Plan document will be made available in appropriate formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the City of San Bruno, Public Services Department at 650-616-7065 at least 72 hours before the meeting, if possible.

The public is invited to attend and comment in the process described above. Written comments may be submitted to the City of San Bruno for inclusion in the public record. Any person unable to attend the public hearing may submit written comments to City of San Bruno, Office of the City Clerk, 567 El Camino Real, San Bruno, CA 94066. If you have questions regarding this notice or the matter to be heard, please contact Will Anderson at (650) 616-7065. In addition, a website has been established as an information source throughout the development process of the groundwater management plan at http://www.southwestsideplan.com.

SMCT#4476932 **June 24, July 1, 2012**

FINAL Notes from First Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
December 18, 2009, 9:00am at San Bruno City Hall

Minutes prepared by Will Anderson and Jim Blanke.

Attendees: Please see attached sign up sheet

Location: San Bruno City Hall, Conference Room 115

Time: 9:00am – 10:30am

ATTENDEES: PLEASE INFORM WILL ANDERSON IMMEDIATELY IF ANY OF THESE ITEMS DO NOT ACCURATELY REPRESENT DISCUSSIONS AT THE MEETING.

General

An introductory presentation was given by Jim Blanke of WRIME describing the background of the Basin and the role of the Advisory Committee in developing the Groundwater Management Plan (Plan). During the presentation, Greg Bartow of SFPUC also provided a brief description and update about the Regional Groundwater Storage and Recovery Project being planned for the South Westside Basin.

Key comments and action items are listed below.

Comments

Goal

- The proposed goal was accepted with one addition: to include an economic aspect. The accepted goal is "To ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management."

Existing Groundwater Model

- Daly City is the lead agency responsible for preparation and upkeep of the groundwater model to be utilized in our Plan preparation and analysis.
- Daly City plans to continue refinement of the model based on new data, including new water level and production data as well as information developed through the new monitoring wells installed for the Regional Groundwater Storage and

Recovery Project. Daly City will present to their City Council in January a proposal to continue model updates through the end of 2010.

- The assumed groundwater usage data used for model calibration benefits by confirmation by all users, especially the irrigators who mostly have unmetered wells.
- The Plan development will need to identify and address gaps in the available data to ensure future model updates have sufficient data.
- The groundwater model indicates a decline in storage in the South Westside Basin of approximately 750 AFY. While the model quantitatively integrates a large amount of data, this rate is within the range of modeling and data uncertainties associated with any groundwater analysis.

Group Discussion

- Colma stated that they have to report back to their decision-makers about Colma's role in the Advisory Committee. The Plan development process will address various technical and procedural issues in the Basin including governance.
- Research of potential options to recharge the aquifer are recommended to include stormwater retention/detention.

Next Steps

- The Plan development process will be coordinated with any requirements of the grant funding and State laws governing Groundwater Management Plans.
- It was suggested that the timing of the Public Hearing for Intention to Adopt the Plan be coordinated such that more technical data be obtained before presenting the Intention to City Councils.
- San Bruno, as lead agency, is the only entity required to adopt the Intention to Adopt/Draft a Groundwater Management Plan. Other agencies may choose to do so as well if desired.
- A public meeting will be scheduled to discuss an updated version of the information presented at this meeting to the general public. Target date is mid January.
- The next Advisory Committee meeting will focus on Basin Management Objectives, Elements, and Projects and is targeted for late January.

End of minutes.

FINAL Notes from Second Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
March 11, 2010, 1:30pm at San Bruno City Hall

Minutes prepared by David Veilleux and Jim Blanke

Attendees: Please see attached sign up sheet

Location: San Bruno City Hall, Conference Room 115

Time: 1:30pm – 3:30pm

General:

A presentation of Basin Management Objectives (BMO) was given by Jim Blanke of WRIME. Basin Management Objective topics included Water Quality, Land Subsidence, and Water Levels/Storage and their role in the overall goal of the Groundwater Management Plan. There was also a brief discussion of Senate Bill SBx7 6 given by Mark Nordberg of DWR.

Key Comments

- BMOs – Quantitative measures of success for basin management
    - Land subsidence
        - No reported subsidence – Qualitative BMO
    - Water quality
        - Thresholds are difficult to use for regional contamination issues as there is a time lag as contaminated water reaches groundwater. Seawater intrusion (SWI) can be more quickly mitigated through reduced pumping.
        - Monitor for constituents other than chloride to help predict SWI. Try to coordinate with DPH testing to monitor for other possible markers of SWI in production wells.
        - Plan should focus on regional water quality. Do not set basin wide groundwater quality BMO. Break basin down into subregions. Propose common methodologies to each subregion to develop individual thresholds.
        - Deep water quality is generally good. There is some upwelling of saline water in South San Francisco (SSF) and potentially elsewhere. Could be sediments, exact source/cause is unknown. Wells 20 and 21 in SSF have relatively high levels of chloride.
    - Water levels/storage

        - Some cascading water levels in San Bruno wells. Several basin wells are shallow, including some CalWater wells. 2 cemetery wells are being replaced (same capacity and gpm but deeper)
        - Do not set BMO based on shallowest well in Basin. For monitoring, the Plan should address using existing infrastructure and possibly expanding to protect against SWI. Investigate raising basin-wide groundwater levels to reduce the risk of SWI.
        - May want to consider a dynamic operating range for water level BMO. This will help manage drought situations. Determine different ranges of health for the basin, broken down by subregion.
        - Consider making a moving average range for groundwater levels
        - Groundwater storage in the basin is losing about 750 AFY of storage based on modeling results.
        - Take SFPUC groundwater banking project into account when developing thresholds.
        - Increase monitoring efforts. Investigate adding more monitoring wells where data is sparse or in areas of concern.
        - Impact of new SFPUC wells (in the Sunset District) on the flow of groundwater within the Basin is still under study.

    - Surface water impacts to groundwater
        - No significant surface water bodies in the basin. Do not need to account for storm water runoff as part of a surface water-related BMO. (Maybe mention in Plan that it was considered but deemed unnecessary.)
    - Enforcement of BMO
        - Trigger points set responses, recommend no specific enforcement required by Plan.
        - Reporting will highlight potential problem areas and focus attention on needs.

- Management Zones
    - Develop Management Zones
        - Unique areas with distinct BMOs. Best to define through geologic or hydrologic distinctions.
        - Potential management zones are defined by production well location, water quality data, city boundaries, and water purveyor service areas. There is no clear geological definition for these Zones.

Discussion

- Should pay attention to upwelling. Also monitor thresholds to ensure that the future costs to customers remain reasonable.
- Colma – needs to report to their governing body regarding the progress and details of the plan. Concerned about Plan development governance process.

- Hydrofocus- Aquifer has mostly reached equilibrium. Only known water-level-dependent major recharge zone is San Mateo/San Francisco County boundary. Groundwater model should be run to determine if current pumping levels could maintain a higher water level.
- Cemeteries are good source of recharge. Should try and expand the recharge capability of this land.
- BAWSCA – consider adding freeboard to any threshold requirements to better manage supplies.

Next Steps

- Ongoing coordination with stakeholders as Plan development proceeds.
    - WRIME to send draft BMO information, including proposed methodologies, to Advisory Committee and receive and organize comments via email.
- Schedule public meetings regarding progress of Plan.
- Develop Basin Management Objectives, Plan Elements, Potential Projects.

FINAL Notes from Third Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
June 24, 2010, 10:30am at San Bruno City Hall

Minutes prepared by Will Anderson and Jim Blanke

Attendees: Please see attached sign up sheet

Location: San Bruno City Hall, Conference Room 115

Time: 10:30am – 12:15pm

General:

Mark Nordberg of DWR provided a handout and brief update on the upcoming SB 6 Program for groundwater elevation monitoring. The program is currently being finalized by the State. The proposed Groundwater Management Plans for the North and South Westside Basin, with minor refinements and coordination, can be easily utilized to conform with the reporting requirements of SB 6. The DWR SB 6 contact for our basin will be Mark. Workshops to present the program are upcoming with a potential August 18 workshop in Sonoma being the nearest to the Bay Area.

Greg Bartow, SFPUC, also mentioned an upcoming groundwater conference in Burlingame and will email details to the Advisory Committee (AC). Conference information can be found at http://www.grac.org/am2010.asp.

Jim Blanke, WRIME, gave the keynote presentation regarding the proposed Best Management Objectives (BMOs) for the South Westside Basin Groundwater Management Plan (GWMP). Generally, comments on the draft BMOs presented at the 2nd AC meeting were addressed with revised recommendations presented.

Key Comments

- Resolution of Intent to Draft
    - Needs to occur sooner rather than later as it is tied to the schedule for public meetings.
    - The current schedule calls for adoption of the GWMP by December 31, 2010.
    - Confirm all stakeholders are supportive prior to placing on public agendas.
    - Patrick prefers to have the BMOs in place prior to informing elected officials of the GWMP.
    - Brad and Will to coordinate on outreach to cemeteries to gauge their concurrence. Greg has had recent successful contact with most of the cemeteries.

- Mark mentioned that a documented due diligence public outreach process is important to DWR, the agency funding the GWMP.
- John mentioned as a potential reference an appendix in the previous draft GWMP that described a public outreach process previously used in our Basin.
- Environmental documents beyond a categorical exemption are usually not required for planning-type documents, unless detailed construction projects are included. Our GWMP is not anticipated to include specific construction projects.

- Water Level BMO
  - It was decided to incorporate the most recent well data even though these wells do not have significant historical data for use in threshold development.
  - The groundwater model can be utilized to estimate previous historical low water levels for wells without sufficient historical data
  - The groundwater model is proposed to be extended annually to provide estimated water levels. The annual extension may be reviewed by the AC.
  - The banked water from the Storage and Recovery (Conjunctive Use) project is not to be utilized in the water level determinations.
  - Adequacy of data collection and potential options for increased recharge to be addressed in the "elements" section of the GWMP.
  - The BMOs will not average across sub-areas, and as many wells as reasonable will be presented, with thresholds of "historical low" groundwater level."

- Chloride BMO
  - The threshold of 150 mg/l will be modified to 125 mg/l based on 50% of the 250 mg/l MCL (maximum contaminant level).
  - Age-dating of the groundwater at various locations is recommended to determine a potential time-lag between a contamination event and the contamination of the groundwater (potential for Elements – Monitoring).

- Nitrate BMO
  - Patrick noted that the nitrate concentrations measured at the point of entry into the distribution system may be lower than those measured at individual wells.
  - Nitrate BMO will not average across sub-areas, and will use as many wells as reasonable, with thresholds modified to 80% and 90% of the MCL.

- Land Subsidence BMO
  - Land subsidence is caused by a combination of fluid withdrawl and tectonic movements. Separation of the 2 causes is difficult.
  - Greg mentioned the SFPUC is having a land subsidence study performed by Fugro. Results of that study may be incorporated into the GWMP

    - It was decided that implementation would include analysis using InSAR to determine if there is active subsidence from fluid withdrawl. This analysis could be repeated at a 10-year monitoring interval, depending on the results of the initial analysis.

- BMO Thresholds
    - It was decided that all subareas would not be used.

- Groundwater Recharge
    - The GWMP will outline the most productive existing areas of recharge within the basin.
    - The groundwater model can provide a good estimate of the recharge areas.
    - Klara mentioned San Bruno's updating of its Stormwater Master Plan will incorporate recommendations developed by the GWMP.
    - Potential BMP's regarding recharge may be considered by the AC in the future. Existing soils conditions can be investigated during the "Implementation" phase of the GWMP.

- Coordination with San Mateo County regarding Known Haz Mat Sites
    - Patrick will coordinate with Greg Smith of SM County Health Dept to ensure the known hotspots within our basin are identified and accounted for during future basin analyses.

- Miscellaneous
    - Any outstanding comments on the draft BMO's to be provided to Jim and/or Will within the next 2 weeks, although the GWMP is a flexible document that can be amended in the future.
    - The schedule for GWMP development still calls for adoption of the GWMP by December 31, 2010, although an extension to May 2011 from the DWR may be feasible.

Next Steps

- Ongoing coordination with stakeholders as Plan development proceeds.
- Finalize Basin Management Objectives.
- Public Partner Agencies (San Bruno, Daly City, SFPUC) to schedule adoption of Resolutions of Intent to Draft the GWMP. Option for other public agencies over the basin (Colma, South San Francisco) to adopt resolutions. Cal Water to support Colma and South San Francisco if they choose to adopt.
- Schedule public meetings regarding progress of Plan after Resolutions are adopted.
- Next AC meeting will address Governance and Finance.

End of minutes

FINAL Notes from Fourth Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
August 16, 2010, 3:00pm at San Bruno City Hall

Minutes prepared by Will Anderson and Jim Blanke

Attendees: Please see attached sign up sheet

Location: San Bruno City Hall, Conference Room 115

Time: 3:00pm – 5:00pm

General:

Jim Blanke, WRIME, gave the keynote presentation regarding the proposed options regarding Governance and Financing for the South Westside Basin Groundwater Management Plan (GWMP).

Key Comments

- Summary of Previous Meeting
    - To finalize the recommended Best Management Objectives (BMO's) as agreed to at the 3rd Advisory Committee meeting, the updated results of the groundwater model will be needed.
    - The updated groundwater model is scheduled for draft release to the other agencies after Labor Day, with a 30-day peer review period before it is finalized.

- Resolution of Intent to Draft
    - San Bruno will conduct a public hearing and present to its Council on 8/24/10 a recommendation to adopt a Resolution of Intent to Draft the GWMP.
    - Patrick of Daly City would like the wording in the draft Resolution confirmed, citing AB 303 requirements instead of the AB 3030 requirements.
    - Action item - Will to confirm wording in the Resolution and provide copies of the San Bruno Council packet to all Advisory Committee members.
    - Klara noted that the adopted GWMP will serve, in part, to tie together numerous existing water issues in San Bruno (i.e., Conjunctive Use, reallocations, Master Plan updates for Urban Water and the Water System).
    - The current schedule for completion by the end of the calendar year is still valid. Adoption of the GWMP may extend beyond the calendar year due to limited Council meetings in December.
- Public Meetings
    - It was decided to host 3 of the 5 required Public Meetings at San Bruno on 9/9/10, at Daly City on 9/23/10, and at Colma on or around 10/7/10. The hosting agency will advise Will or Jim of the preferred time, date, and location

as soon as possible. The scope of the meetings will be the same for the three meetings, providing a summary of the GWMP development to date and gathering input from the public to improve the plan.
    - The final 2 required Public Meetings will be hosted by San Bruno for the presentation of the draft GWMP and the adoption of the final GWMP.
    - Public outreach regarding the 3 initial meetings will be performed by the hosting agency as they are most familiar with how to reach their stakeholders. Outreach may include web site postings, newspaper ads, and the distribution of public information pamphlets in billings of Cal Water customers. San Bruno and Daly will do public noticing through available avenues including potentially a short video clip for viewing on local cable TV and the project website.

- Governance
    - Two governance models were presented, an Individual Interest Model (ie a Memorandum of Understanding or MOU) and a Mutual Interest Model (i.e. a Joint Powers Agreement or JPA).
    - It was noted that Cal Water and other private entities such as golf courses and cemeteries are not capable of entering into a JPA although Cal Water has previously entered into MOU's.
    - It was generally agreed to improve on the existing positive collaborations between the participants using a less-formal structure and keeping the focus at a policy level, versus project-specific.
    - The agreement will be a detailed MOU to be developed by WRIME and will define the various roles and responsibilities, continue the existing cooperation and account for future needs and future project implementations. Longevity of the agreement is also a critical concern.
    - Mark of DWR noted the governance structure is mainly for the implementation of the adopted GWMP (not of great concern to DWR) but the engagement of the public during the development of the governance structure is important and of concern to DWR.
    - A discussion of the preferred governance will be included in the GWMP. Finalization and signing of the MOU will occur during implementation of the GWMP, after the plan has been adopted.

Next Steps

- Ongoing coordination with stakeholders as Plan development proceeds.
- Host Public Meetings
- Incorporate forthcoming groundwater modeling results into the Basin Management Objectives.
- Next AC meeting will address the draft version of the GWMP.

End of minutes

FINAL Minutes from the Fifth Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
February 3, 2011, 1:30pm at San Bruno City Hall

Minutes prepared by Will Anderson and Jim Blanke

Attendees: Please see attached sign up sheet

Presentation Slides: Please see attached copy

Location: San Bruno City Hall, Conference Room 115

Time: 1:30pm – 3:30pm

Please notify Will Anderson at 650-616-7052 if the information presented below is incomplete or incorrect.

General:

Jim Blanke of WRIME and John Fio of HydroFocus presented the process and the results of the draft version of the updated groundwater model that encompasses the entire Westside Basin, which includes the South Westside Basin. The application of the model to develop an estimate of yield for the basin was also discussed.

Jim Blanke also presented the monitoring and reporting requirements for the State Department of Water Resources (DWR) CASGEM Program (California Statewide Groundwater Elevation Monitoring Program).

Key Comments

- Updated Groundwater Model – Draft Version
    - By adding new additional calibration points (new cluster wells in the South Westside Basin), the revised draft model now better reflects actual groundwater elevations obtained from the new calibration points. Previously, vertical head gradients were poorly understood due to the long screens on active and former production wells. The groundwater elevations that were updated are now higher than shown in the previous model version and match the elevations in the new cluster wells.
    - The revisions reflect how the model is impacted by changes to input parameters. Actual metered water usages at Golf Courses compared to estimated usages contributed to the improved accuracy of the model. Additional data for water levels and production from private producers would help improve model accuracy.
    - The updated model will be used to develop thresholds for groundwater elevations BMO (Basin Management Objective).

- The model is a living model intended to incorporate new data and information over time. Model updates by Daly City are planned on a 2-year interval.
- Additional outreach to the cemeteries was discussed to encourage sharing of information about production to improve the basin understanding. It was suggested to install free water meters on wells to monitor actual water usage at cemeteries. It will take time to understand the issues the Cemeteries may have with meters and to build trust with the Cemeteries. Open communications with them and the entire Advisory Committee will be continued.
- Additional information on the per acre usage of water at the cemeteries may be available for cemeteries using exclusively CalWater supplies, although these areas may use less water due to higher unit cost.
- The South Westside Basin average annual change in storage from the model has changed from approximately 700 AFY decline to less than 100 AFY decline.
- The yield for the South Westside basin is estimated as 8,700 AFY
- The yield for the Westside basin is estimated as 10,600 AFY, not accounting for increased potential yield from intercepting subsurface outflow to the Pacific Ocean.
- The yield values are developed based on maintaining current groundwater levels over the long-term. These yield values do not address the risk of seawater intrusion, which will continue even if pumping does not exceed the yield.
- The Basin yield is directly related to groundwater elevations.
- It was recommended that an additional meeting be scheduled in Colma to outreach this new data to the Cemeteries. Date and time to be determined.
- Another alternative to improve model accuracy is to add tracers to the groundwater and/or perform isotope sampling to find areas and times of recharge.

- CASGEM
    - It was agreed to build on the existing monitoring and reporting program already in place as part of SFPUC's Annual Reporting to DWR. Purveyors in the Basin (Cal Water, Daly City, San Bruno and SFPUC) will form a Voluntary Cooperative Groundwater Monitoring Association (VCGMA) and enter into an agreement suitable to DWR (maybe a one-page Memorandum of Understanding [MOU]). A recommended draft MOU including the reporting process will be provided by WRIME.
    - Water level data will be collected by the agency that owns the well and reported to SFPUC. SFPUC, operating through the VCGMA, will report the values to DWR as well as continue to include the data in the annual report.
    - Water level data reported to DWR will be a subset of the data included in the annual report. The actual wells to be included will be determined this summer.

Next Steps

- Ongoing coordination with stakeholders as Plan development proceeds.
- Host Public Meeting in Colma to present the updated groundwater model results to the Cemeteries

- Incorporate updated groundwater modeling results (yield and groundwater elevations) into the Basin Management Objectives.
- Prepare Draft version of GWMP for review by the Advisory Committee. Comments from the Committee will be incorporated before being released for Public review.
- Develop Voluntary Cooperative Groundwater Monitoring Association and notify DWR of intent to be a monitoring entity.

End of minutes

FINAL Minutes from the Sixth Advisory Committee Meeting
For the Groundwater Management Plan for the South Westside Basin
April 28, 2011, 10:00am at San Bruno City Hall

Minutes prepared by Will Anderson and Jim Blanke

Attendees: Please see attached sign up sheet

Presentation Slides and Handouts: Please see attached copies

Location: San Bruno City Hall, Conference Room 115

Time: 10:00am – 12:00pm

Please notify Will Anderson at 650-616-7052 if the information presented below is incomplete or incorrect.

General:

Jim Blanke of WRIME provided an update of the current status of the Groundwater Management Plan and provided information to focus the review to be performed by the Advisory Committee. **Comments are due on May 6, 2011.**

Patrick Sweetland provided information on the recent update to the Westside Basin Groundwater Flow Model, which includes the South Westside Basin.

Jim Blanke also lead the discussion on roles and responsibilities for participation in the State Department of Water Resources (DWR) CASGEM Program (California Statewide Groundwater Elevation Monitoring Program) and provided an update and discussion on opportunities for additional funding through the next round of AB303 funding expected this fall.

Key Comments

- Updated Groundwater Model – Draft Version
    - Although the model has been out for review, the model is still considered to be in draft form. The major revisions were made to Tables 5 and 7.
    - Any additional **comments are to be submitted to John Fio of Hydrofocus via Patrick Sweetland of Daly City by May 12, 2011** at which time a final version of the model may be issued.
    - If anyone needs copies of the written summary of the changes to the model, please notify Will Anderson of San Bruno.
    - Results of the draft model (version 3.0) were used in the draft version of the Groundwater Management Report (GWMP). Results of the final model (version 3.1) will be incorporated into the yield and water budget information in

the updated version of the GWMP. Existing version 3.0 data is sufficient for use in the Water Level BMO calculations.
  - Continue to define needs for additional well installations to better refine the model. "Ideal" well locations for accurate monitoring will be developed. Proposed installations will account for required costs.

- Draft Groundwater Management Plan (GWMP)
  - Access to the draft GWMP was provided to members of the Advisory Committee (AC) prior to the Advisory Committee meeting.
  - **The deadline to provide comments on the draft GWMP is May 6, 2011.** Comments may be provided to either Will Anderson or Jim Blanke.
  - A written response to comments received will be developed and distributed to the AC and any party submitting comments.
  - Jim briefly summarized the various sections of the draft GWMP.
  - Jim also highlighted sections of the draft GWMP that are recommended for review by the various purveyors.
  - Cal Water and SFPUC did provide specific comments on the draft GWMP at the meeting.

- AB 1881 (Landscape Ordinance)
  - Colma is considering modifications to their Landscape Ordinance to credit Cemeteries for a portion of irrigation water used accounting for a portion of water being used serving as recharge.
  - The intent is to work in tandem with the GWMP and incorporate any lessons learned from Colma's experiences into the GWMP.

Next Steps for Draft GWMP

- Ongoing coordination with stakeholders as Plan development proceeds.
- Host Public Meeting (tentatively scheduled in Colma, day and time TBD) to present the draft GWMP to the Cemeteries and other interested members of the Public.
- Schedule calls for completion of the final GWMP by June 30, 2011.

CASGEM (California Statewide Groundwater Elevation Monitoring program)

- Preliminary program notification to Department of Water Resources (DWR) to be performed by San Bruno via RMC-WRIME.
- The group will be representing only the South portion of the Westside Basin. Reporting for the North portion of the Basin will be performed by SFPUC.
- Activities for the group will be performed by the following agencies:
  - Notify DWR – San Bruno via RMC-WRIME
  - Develop Monitoring Plan – SFPUC's plan for the north Basin will be provided to the group and will serve as the model for the south Basin, which will be developed by San Bruno via RMC-WRIME
  - Monitoring – SFPUC
  - Compilation of data – SFPUC
  - Reporting of results to DWR – San Bruno via RMC-WRIME

- Please refer to the attached for a draft version of the Letter of Mutual Understanding (LOMU) to be signed by the Partner Agencies. **Provide comments to Will Anderson by May 13, 2011.** Comments will be incorporated and the LOMU will be circulated for signatures. LOMU must be in place prior to notification of DWR.
- The Cities of Burlingame and Millbrae will not be included in the LOMU.
- The LOMU is intended for approval by the Director or City Manager level. Approval by respective governing boards is not intended.
- Mark Nordberg of DWR presented information about the submittal process to DWR. An informational document of what DWR would like to see is pending.
- The goal of the program is to monitor seasonal highs and lows of groundwater elevations.

AB 303 Grant Opportunities

- Applications for grant funding opportunities are expected to be accepted this fall.
- Proposed applications/projects should be consistent with the GWMP.
- Examples of opportunities were included in the presentation handouts.

Information Items

- Mark from DWR has emailed to the AC information about groundwater management plan references.
- Greg from SFPUC will email to Will an update on their installation of six new wells. Will to distribute to the AC upon receipt.

End of minutes

APPENDIX B – CONSUMER CONFIDENCE REPORTS

WHAT YOU SHOULD KNOW ABOUT DRINKING WATER SAFETY

REDUCING LEAD FROM PLUMBING FIXTURES

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Burlingame Water Division is responsible for providing high-quality drinking water, but cannot control the variety of materials used in your household or building plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline 800-426-4791, or at www.epa.gov/safewater/lead.

CRYPTOSPORIDIUM

Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2010. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of Cryptosporidium may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

The San Francisco Public Utilities Commission (SFPUC) uses an extensive water sample collection and testing protocol at its various water sources throughout their transmission system. During 2010 over 58,750 water samples were collected and analyzed by the SFPUC Water Quality division. The City of Burlingame also collects and analyzes samples throughout our distribution system including our storage reservoirs. The SFPUC Water Quality Bureau performed our microbiology & general chemistry analysis at their water quality lab located in Millbrae. The results of the water sample analyses are provided in this report.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

SEISMIC RELIABILITY. DELIVERY RELIABILITY. WATER SUPPLY RELIABILITY

People, businesses, and the economy in the Bay Area depend on a reliable water system. That's why the San Francisco Public Utilities Commission (SFPUC) is rapidly moving forward with the Water System Improvement Program (WSIP) to create long-lasting improvements to our aging water infrastructure and sustain the quality of life for our 2.5 million residential, commercial, and industrial customers in the San Francisco Bay Area. Approximately one-third of delivered water goes to retail customers in San Francisco, while wholesale deliveries to 27 suburban agencies in Alameda, Santa Clara, and San Mateo counties comprise the other two-thirds.

HOW WSIP WILL AFFECT BURLINGAME RESIDENTS

The San Francisco Public Utility Commission (SFPUC) will be replacing their Crystal Springs #2 pipeline which runs down El Camino Real and spans 3.2 miles from Bellevue Avenue to Meadow Glen Avenue in Millbrae. As an estimated 15 months of pipeline work gets underway, Burlingame Residents can expect some changes in their daily driving routines. In June 2011, the pipeline work will begin, necessitating the closure of one or two lanes on El Camino Real. One lane in each direction will be open at all times, and warning signs signifying lane closures will be placed well in advance. Work on the pipelines will take place from 7 a.m. until 2 p.m. Monday through Friday and 8 a.m. until 6 p.m. on Saturdays. No Sunday or night work is anticipated. In total, there are 11 work pits along the 3.2 mile stretch of El Camino Real involved in the project. Seven of those pits are in Burlingame, but only two will be worked on at any given time.

Residents wanting more information can visit http://www.sfwater.org/cspl2 to sign up for email updates. Information is also posted on our Burlingame city website and a 24 hour answering service at 866-973-1476.

City of Burlingame
501 Primrose Road
Burlingame, CA 94010

WATER QUALITY REPORT 2010

FOR MORE INFORMATION

If you would like additional information or if you have any questions concerning the City of Burlingame's testing data or water system, please call the Public Works Department at (650) 558-7670, or write to City Hall, Public Works Department, Water Quality Report, 501 Primrose Road, Burlingame, CA 94010. You may also wish to visit the City's website at www.burlingame.org The City of Burlingame City Council meets twice a month on the first and third Monday at 7:00 p.m. in the Council Chambers at City Hall.

Decisions about water quality issues are made from time to time in public meetings of the San Francisco Public Utilities Commission (SFPUC). The SFPUC meets twice a month on the second and fourth Tuesday at 1:30 p.m. Meetings are held at San Francisco City Hall, Room 400. Inquiries about these meetings can be made by calling the office of the Commission Secretary at (415) 554-3165 or visit their website at www.sfwater.org

Do you want to learn more about drinking water regulations? Visit the California Department of Health Services at www.dhs.ca.gov or the U.S. Environmental Protection Agency website at www.epa.gov

City of Burlingame
Rob Mallick – Public Works Superintendent. . . . . (650) 558-7670
City of Burlingame website . . . . www.burlingame.org

San Francisco Public Utilities Commission
Water Quality Bureau. . . . . (650) 872-5950
Customer Service Bureau. . . . . (415) 551-3000
Website . . . . www.sfwater.org

California Department of Public Health
District 17 - Santa Clara/San Mateo . . . . (510) 620-3474
Home Treatment Device Certification Unit. . . . . (916) 327-1140
Website . . . . www.dhs.ca.gov

Safe Drinking Water Hotline . . . . (800) 426-4791
Website . . . . www.epa.gov

BURLINGAME

2010 Water Quality Report

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

此份有關你的食水報告,內有重要資料和訊息,請找他人為你翻譯及解釋清楚。

BURLINGAME'S DRINKING WATER SOURCES

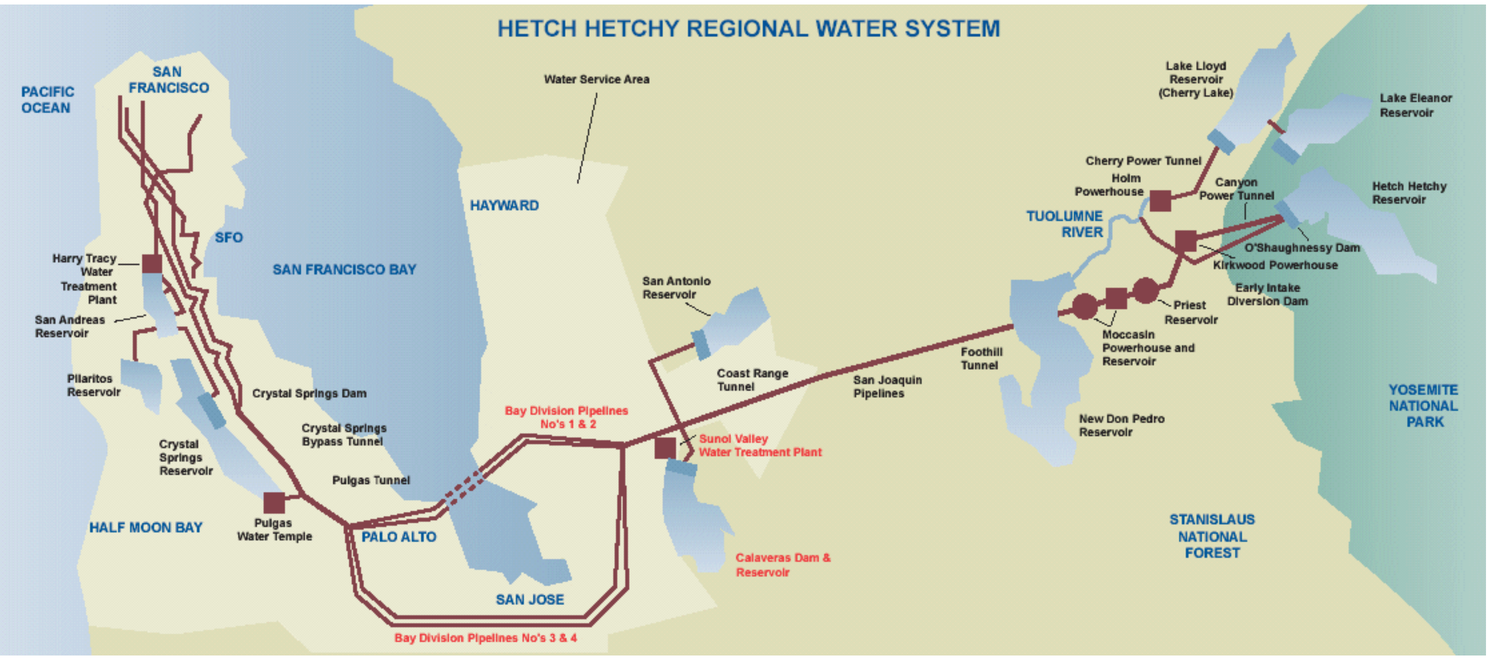
The sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells. For the SFPUC system, the major water source originates from spring snowmelt flowing down the Tuolumne River to the Hetch Hetchy Reservoir, where it is stored. This pristine Sierra water source meets all federal and state criteria for watershed protection. The SFPUC also maintains stringent disinfection treatment practices, extensive bacteriological-quality monitoring, and high operational standards. As a result, the California Department of Public Health and USEPA have granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that the SFPUC is not required to filter water from the Hetch Hetchy Reservoir.

The Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff from the Alameda Watershed, spanning more than 35,000 acres in Alameda and Santa Clara counties, are collected in the Calaveras and San Antonio reservoirs and treated at the Sunol Valley Water Treatment Plant before distribution. Rainfall and runoff from the 23,000-acre Peninsula Watershed in San Mateo County are stored in Crystal Springs, San Andreas, and Pilarcitos reservoirs and treated at the Harry Tracy Water Treatment Plant before distribution.

In 2010, the Hetch Hetchy Watershed provided the majority of our total water supply, with the remainder contributed by the local watersheds.

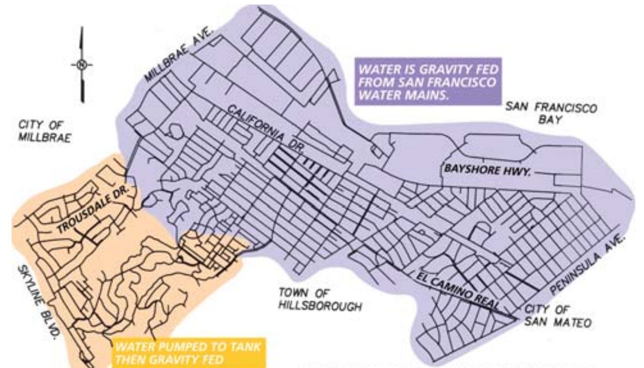
OUR MISSION: Quality Water

The City of Burlingame in coordination with the San Francisco Public Utilities Commission (SFPUC) is pleased to present our 2010 Annual Water Quality Consumer Confidence Report. We want our customers to know where their water comes from, how it is treated to ensure it is top quality and the results of water quality monitoring performed by the City of Burlingame and the SFPUC. With this knowledge, consumers can make health decisions concerning their water use. During 2010 the SFPUC and the City of Burlingame monitored the water quality by collecting health samples. The City of Burlingame collected 850 water quality samples and we are very pleased to announce that the City of Burlingame has met all Federal (USEPA) and State drinking water health standards in 2010. The City of Burlingame and the SFPUC is committed to customer service and providing you with high quality water.



BURLINGAME WATER SYSTEM SERVICE AREA

The City of Burlingame purchases all of its water from the San Francisco Public Utilities Commission (SFPUC). The SFPUC has several large pipelines running through town. We have six metered connections at various locations throughout the city. These connections feed directly into the Aqueduct zone (Purple area on map). Water is pumped to the higher elevations by booster pump stations and to storage reservoirs. To regulate the pressure in the higher elevations we have several pressure reducing valves.



BURLINGAME WATER SYSTEM

ENSURING THE HIGHEST WATER QUALITY

WATER QUALITY: CONTAMINANTS AND REGULATIONS

The SFPUC's Water Quality Division regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2010, Water Quality staff conducted more than 58,750 drinking water tests in the transmission and distribution systems. This monitoring effort is in addition to the extensive treatment process control monitoring performed by our certified and knowledgeable treatment plant staff and online instruments.

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline 800-426-4791.

CONTAMINANTS THAT MAY BE PRESENT IN SOURCE WATER INCLUDE:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Health Services (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that must provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

Key Water Quality Terms

Following are definitions of key terms noted on the adjacent water quality data table. These terms refer to the standards and goals for water quality described below.

PUBLIC HEALTH GOAL (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

MAXIMUM CONTAMINANT LEVEL GOAL (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

MAXIMUM CONTAMINANT LEVEL (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

MAXIMUM RESIDUAL DISINFECTANT LEVEL (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MAXIMUM RESIDUAL DISINFECTANT LEVEL GOAL (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

PRIMARY DRINKING WATER STANDARD (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

TREATMENT TECHNIQUE (TT): A required process intended to reduce the level of a contaminant in drinking water.

TURBIDITY: A water clarity indicator that is also used to indicate the effectiveness of the filtration plants. High turbidity can hinder the effectiveness of disinfectants.

REGULATORY ACTION LEVEL: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.turbidity can hinder the effectiveness of disinfectants.

SPECIAL HEALTH NEEDS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline 800-426-4791 or at www.epa.gov/safewater.

WATER QUALITY DATA FOR YEAR 2010

The table below lists all 2010 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits are not shown, in accord with the CDPH guidance. (Note: The CDPH allows the SFPUC to monitor for some contaminants less than once per year because their concentrations do not change frequently. The SFPUC received from the CDPH a monitoring waiver for some contaminants that were absent in the water.)

DETECTED CONTAMINANTS	Unit	MCL	PHG or (MCLG)	Range or Level Found	Average or [Max]	Major Sources in Drinking Water
TURBIDITY						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.6 (2)	[4.9] (3)	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU -	1 (4) min 95% of samples ≤0.3 NTU (4)	N/A N/A	- 97.6% - 100%	[0.54] -	Soil runoff Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU -	1 (4) min 95% of samples ≤0.3 NTU (4)	N/A N/A	- 100%	[0.19] -	Soil runoff Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR (SFPUC Regional System) - for information only						
Total Trihalomethanes	ppb	80	N/A	14 - 92	[40] (5)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	7 - 55	[25] (5)	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	TT	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
DISINFECTION BYPRODUCTS AND PRECURSOR (City of Burlingame)						
Total Trihalomethanes	ppb	80	N/A	37.6 - 67.7	50.9 (5)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	23.2 - 42.1	33.9 (5)	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	N/A	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
MICROBIOLOGICAL (City of Burlingame)						
Total Coliform Giardia lamblia	- cyst/L	≤5.0% of monthly samples TT	[0] [0]	0 - 2.3 ND - 0.06	2.3 [0.06]	Naturally present in the environment Naturally present in the environment
INORGANIC CHEMICALS						
Fluoride (source water) (7)	ppm	2.0	1	ND - 0.15	ND (8)	Erosion of natural deposits
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	1.80 - 2.07	1.98 (5)	Drinking water disinfectant added for treatment
CONSTITUENTS WITH SECONDARY STANDARDS	**Unit**	**SMCL**	**PHG**	**Range**	**Average**	**Typical Sources in Drinking Water**
Chloride	ppm	500	N/A	3 - 16	9.5	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	33 - 316	179	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.6 - 38.7	18.2	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	27 - 174	95	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.07 - 0.33	0.16	Soil runoff
LEAD AND COPPER (City of Burlingame)	**Unit**	**AL**	**PHG**	**Range**	**90th Percetile**	**Major Sources in Drinking Water**
Copper	ppb	1300	300	3.5 - 188	60.6	Corrosion of household plumbing systems
Lead	ppb	15	0.2	<1 - 19.6 (9)	2.1	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as CaCO3)	ppm	N/A	8 - 98	49
Bromide	ppb	N/A	<10 - 17	<10
Calcium (as Ca)	ppm	N/A	2 - 26	12
Chlorate (12)	ppb	(800) NL	92 - 357	150
Hardness (as CaCO3)	ppm	N/A	8 - 104	53
Magnesium	ppm	N/A	0.3 - 9	4.6
pH	-	N/A	8.2 - 8.7	8.5
Potassium	ppm	N/A	0.34 - 1.2	0.6
Silica	ppm	N/A	4.1 - 7.6	5.7
Sodium	ppm	N/A	3 - 22	13

KEY:

< / ≤	= less than / less than or equal to
AL	= Action Level
Max	= Maximum
Min	= Minimum
N/A	= Not Available
ND	= Non-detect
NL	= Notification Level
NTU	= Nephelometric Turbidity Unit
ORL	= Other Regulatory Level
ppb	= part per billion
ppm	= part per million
µS/cm	= microSiemens / centimeter

Note:
(1) All results met State and Federal drinking water health standards.
(2) Turbidity is measured every four hours. These are monthly average turbidity values.
(3) This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipelines The turbidity spike was not observed further downstream at Alameda East.
(4) There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.
(5) This is the highest quarterly running annual average value.
(6) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.
(7) The SFPUC adds fluoride to the naturally occurring level to help prevent dental caries in consumers. The CDPH requires our fluoride levels in the treated water to be maintained within a range of 0.8 ppm - 1.5 ppm. In 2010, the range and average of our fluoride levels were 0.6 ppm - 1.5 ppm and 1.0 ppm, respectively.
(8) The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water were ND and 0.15 ppm, respectively. The HTWTP raw water had elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into the Lower Crystal Springs Reservoir, which supplies water via the San Andreas Reservoir to the HTWTP for treatment.
(9) The most recent Lead and Copper Rule monitoring was in 2010. 1 of 30 water samples collected at consumer taps had lead concentrations above the Action Level.

Note: Additional water quality data may be obtained by calling the City of Burlingame water system phone number (650) 558-7670

BURLINGAME WATER QUALITY ASSURANCE PROGRAM

Burlingame Water Quality Assurance Objectives:

- To conduct our water quality monitoring program to assure the water delivered to you meets all water quality standards as determined by the California Department of Health Services and the Federal Environmental Protection Agency.
- To maintain the existing water system infrastructure to assure that it continues to reliably deliver quality water to our customers.
- To construct capital projects that ensure the water system meets water quality standards and continues to reliably deliver quality water in the future.

PROTECTING OUR WATERSHEDS

The SFPUC aggressively protects the natural water resources entrusted to its care. Its annual Hetch Hetchy Watershed survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities by the SFPUC and its partner agencies, including the National Park Service, to reduce or eliminate contamination sources. The SFPUC also conducts sanitary surveys of the local Alameda and Peninsula watersheds every five years. These surveys identified wildllife and human activity as potential contamination sources. The reports are available for review at the CDPH's San Francisco District office (510-620-3474).

FLUORIDE: NATURE'S CAVITY FIGHTER

San Francisco has been adding fluoride to the City's drinking water for more than 50 years to protect dental health. For more information in English, Spanish, or Chinese, call the toll-free SFPUC fluoride information line at 866-668-6008 or visit the SFPUC website at www.sfwater.org/fluoride.

Hetch Hetchy Reservoir from O'Shaughnessy Dam

HOW CAN WE PRESERVE OUR MOST PRECIOUS NATURAL RESOURCE?

- Don't over-water your lawn and water early in the morning or at night to avoid excess evaporation. When planting use drought tolerant vegetation.
- Fully load the dishwasher and clothes washer before running them.
- When brushing your teeth or washing dishes by hand, don't let the water run. Taking shorter showers can save 2.5 gallons per minute.
- Stop leaks. Repair dripping faucets and leaking toilets as soon as possible.
- If you have a swimming pool, use a cover. You will cut the loss of water by evaporation by 90 percent.

You can obtain a free water conservation kit and shower head retrofit kit by calling (650) 558-7670. The City of Burlingame also provides residential rebates for low flush toilet and high efficiency clothes washer purchases

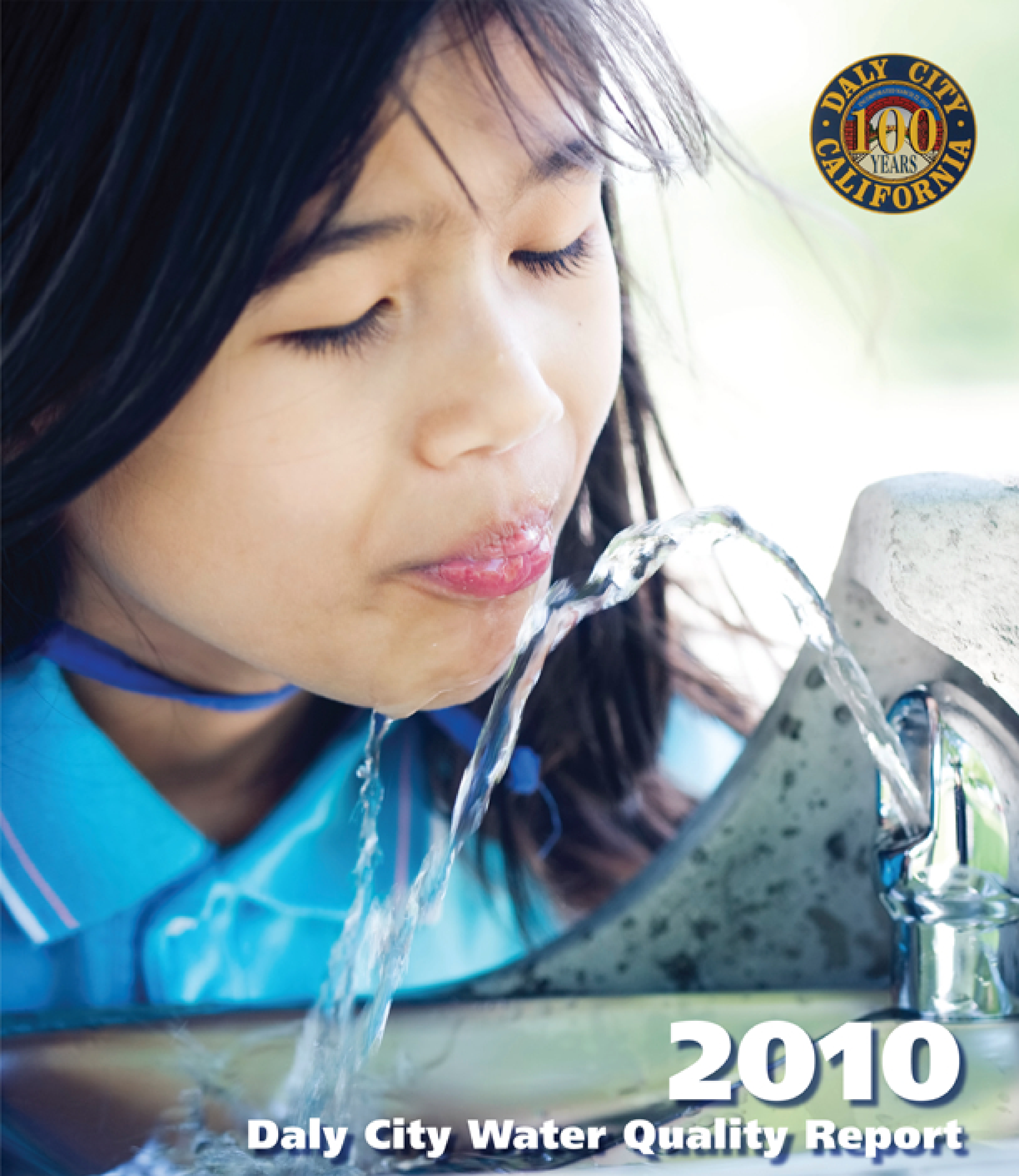
Further water conservation information can be found at the following websites: http://www.sfwater.org, http://www.h2ouse.org, http://www.bawsca.org

BOTTLE WATER

Drinking water, including bottle water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (1-800-426-4791).

STORING EMERGENCY WATER SUPPLIES

Although the SFPUC strives to ensure a reliable supply of water for our customers, a natural disaster such as a major earthquake could interrupt water delivery. Residents are encouraged to store drinking water in case of an emergency. The SFPUC recommends storing at least three days worth of water (one gallon of water per person, per day, including pets) in food-grade plastic containers, such as two-liter soda bottles, and replacing supplies every six months. To learn more about emergency preparedness for yourself and your family, visit www.72hours.org.



2010 Daly City Water Quality Report

To our water customers:

This 2010 Water Quality Report contains required regulatory information about Daly City's water supply and how it complies with State standards. It is your right to know this information and to become an informed customer of your public water system. The City of Daly City is pleased to present this report to you.

2010 Daly City Water Quality Report

Your drinking water undergoes a rigorous monitoring program. It is of the highest quality and meets all mandated regulations of the California Department of Public Health (CDPH) and the United States Environmental Protection Agency (USEPA).

Drinking Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. Such substances are called contaminants. In order to ensure that tap water is safe to drink, the USEPA and the CDPH prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

The Daly City water system is supplied by two sources: surface water supplies managed by the San Francisco Public Utilities Commission (SFPUC) that is blended with groundwater produced by local Daly City wells. Approximately 55 percent of Daly City's average daily demand is supplied from SFPUC surface water supplies. The remaining 45 percent of Daly City's water supply comes from local groundwater wells. Water is drawn from an average of 300 feet below ground from a large underground aquifer known as the Westside Basin. This basin serves a large portion of the northern San Mateo Peninsula and extends north to Golden Gate Park in San Francisco. In many ways groundwater is a better protected source than surface water. Due to its closed environment and

consistent test results, well water is only required to have disinfectants added prior to it being placed into the drinking water distribution system.

The major source of SFPUC surface water originates from spring snowmelt in the Hetch Hetchy Watershed located in Yosemite National Park. This pristine water source meets all federal and state criteria for watershed protection. Because of existing disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the State has granted the Hetch Hetchy water source a filtration exemption.

Hetch Hetchy water is supplemented with surface water from two local Bay Area watersheds. Rainfall and runoff from 35,000 acres in Alameda and Santa Clara counties are collected in the Calaveras and San Antonio Reservoirs. Prior to distribution, water from these reservoirs is treated at the Sunol Valley Water Treatment Plant. In San Mateo County, rainfall and runoff from 23,000 acres in the Peninsula Watershed are stored in Crystal Springs, San Andreas, Pilarcitos and Stone Dam Reservoirs. This water is treated at the Harry Tracy Water Treatment Plant.

How You Can Become Involved

The City welcomes your comments and suggestions on how to improve the municipal water system and better preserve our resources.

Daly City conducts City Council meetings beginning at 7:00 p.m. on the second and fourth Mondays of each month. These meetings are open to the public and are held in the City Council Chamber located on the second floor of the Daly City Civic Center, 333-90th Street.

Important customer information is also available on Daly City's website: **www.dalycity.org**.

City of Daly City - Water Quality Data for 2010[1]

DETECTED CONTAMINANTS	Unit	MCL	PHG or (MCLG)	Range or Level Found	Average or [Max]	Typical Sources in Drinking Water
TURBIDITY [2]						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.6 [3]	[4.9] [4]	Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 [5]	N/A	-	[0.54]	Soil runoff
	-	min 95% of samples ≤0.3 NTU [5]	N/A	97.6% - 100%	-	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 [5]	N/A	-	[0.19]	Soil runoff
	-	min 95% of samples ≤0.3 NTU [5]	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR (SFPUC Regional System) - for information only						
Total Trihalomethanes	ppb	80	N/A	14 - 92	[40] [6]	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	7 - 55	[25] [6]	Byproduct of drinking water chlorination
Total Organic Carbon [7]	ppm	TT	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
DISINFECTION BYPRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	0 - 77.2	[31.2] [6]	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	0 - 57.4	[21.8] [6]	Byproduct of drinking water chlorination
Total Organic Carbon [7]	ppm	N/A	N/A	0.0 - 2.22	1.7	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform	-	NoP ≤5.0% of monthly samples	(0)	-	[0.3]	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	ND - 0.06	[0.06]	Naturally present in the environment
E. coli (Federal Ground Water Rule)	-	0	(0)	ND	ND	Naturally present in the environment
INORGANIC CHEMICALS						
Fluoride (source water) [8]	ppm	2.0	1	ND - 0.7	0.3 [9]	Erosion of natural deposits
Chlorine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.2 - 3.3	1.84	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources in Drinking Water
Aluminum	ppb	200	N/A	<50 - 51	<50	Erosion of natural deposits
Chloride	ppm	500	N/A	3 - 16	9.5	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	Naturally-occurring organic materials
Specific Conductance	μS/cm	1600	N/A	33 - 316	179	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.6 - 38.7	18.2	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	27 - 174	95	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.07 - 0.33	0.16	Soil runoff

LEAD AND COPPER	Unit	AL	PHG	Range	90th Percentile	Typical Sources in Drinking Water
Copper	ppb	1300	300	<4 - 150 [10]	150	Corrosion of household plumbing systems
Lead	ppb	15	0.2	<4 - 76 [10]	<4	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	N/A	8 - 98	49
Boron	ppb	N/A	<100 - 102	<100
Bromide	ppb	N/A	<10 - 17	<10
Calcium (as Ca)	ppm	N/A	2 - 26	12
Chlorate [11]	ppb	(800) NL	92 - 357	150
Hardness (as $CaCO_3$)	ppm	N/A	8 - 104	53
Magnesium	ppm	N/A	0.3 - 9	4.6
pH	-	N/A	8.2 - 8.7	8.5
Potassium	ppm	N/A	0.34 - 1.2	0.6
Silica	ppm	N/A	4.1 - 7.6	5.7
Sodium	ppm	N/A	3 - 22	13

Notes:

(1) All results met State and Federal drinking water health standards. The data is based on Hetch Hetchy water, effluents from both the Sunol Valley and Harry Tracy Water Treatment Plants, and local sources.

(2) Turbidity is a water clarity indicator; it also indicates the effectiveness of the filtration plants.

(3) Turbidity is measured every four hours. These are monthly average turbidity values.

(4) This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipeline. The turbidity spike was not observed further downstream at Alameda East.

(5) There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.

(6) This is the highest quarterly running annual average value.

(7) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.

(8) The SFPUC adds fluoride to the naturally occurring level to help prevent dental cavities in consumers. The CDPH requires fluoride levels in the treated water to be maintained within a range of 0.8 - 1.5 ppm. Daly City water = 0.99 ppm avg in 2010.

(9) The naturally occurring fluoride levels in the Hetchy Hetchy and SVWTP raw water are ND and 0.15 ppm, respectively. The HTWTP raw water has elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into Lower Crystal Springs Reservoir, which supplies water via San Andreas Reservoir to the HTWTP for treatment.

(10) The most recent Lead and Copper Rule monitoring was in 2010. Zero of the 53 water samples collected at consumer taps had either copper or lead concentrations above the Action Level. Further testing will take place in 2013.

(11) Chlorate was not detected in the raw water sources; however, it was detected in the treated water and is a byproduct of the degradation of sodium hypochlorite, the primary disinfectant used by SFPUC for water disinfection.

KEY:

< / ≤	=	less than / less than or equal to
μS/cm	=	microSiemens / centimeter
cyst/L	=	Cysts / Liter
AL	=	Action Level
Average	=	All test results divided by # of tests
Max	=	Maximum
Min	=	Minimum
MCL	=	Maximum Contaminant Level
MCLG	=	Maximum Contaminant Level Goal
MRDL	=	Maximum Residual Disinfectant Level
MRDLG	=	Maximum Residual Disinfectant Level Goal
N/A	=	Not Available
ND	=	Non-Detect
NL	=	Notification Level
NoP	=	Number of Coliform-Positive Samples
NTU	=	Nephelometric Turbidity Unit
ORL	=	Other Regulatory Level
PHG	=	Public Health Goal
ppb	=	parts per billion
ppm	=	parts per million
SMCL	=	Secondary Maximum Contaminant Level
TT	=	Treatment Technique

Additional water quality data may be obtained by calling the Daly City Department of Water and Wastewater Resources at (650) 991-8200

Water Quality Data

The table on the adjacent page lists drinking water contaminants detected in 2010. Contaminants below federally established detection limits, such as arsenic, perchlorate, MTBE, and others, are not listed. The table contains the name of each contaminant, the applicable drinking water standards or regulatory action levels, the ideal goals for public health, the amount detected, the typical contaminant sources and footnotes explaining the findings.

The State allows the San Francisco Public Utilities Commission (SFPUC) to monitor for some contaminants less than once per year because their concentrations do not change. For certain other contaminants that were absent in the water, based on many years of monitoring, the SFPUC received a monitoring waiver from the State.

Results from nitrate testing at one of Daly City's six wells (Well #4) showed amounts in excess of the maximum contaminant level of 45 parts per million; however, the 2010 blended average in the distribution system was 4.3 parts per million.

Nitrate in drinking water at levels above 45 parts per million is a health risk for infants less than six months of age. High nitrate levels in drinking water can reduce the capacity of an infant's blood to carry oxygen, resulting in serious illness. Symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 parts per million may affect the ability of the blood to carry oxygen for other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant or pregnant, you should seek advice from your health care provider. Additionally, nitrate levels may rise quickly for short periods of time due to rainfall or agricultural activity.

During each quarter of 2008, Daly City completed the required monitoring for 25 contaminants under the USEPA's second Unregulated Contaminant Monitoring Regulation (UCMR). None of the 25 contaminants were detected. A list of the 25 contaminants is available at USEPA's website: *http://www.epa.gov/safewater/ucmr/ucmr2/basicinformation.html#list.* The third UCMR is scheduled for 2012.

Contaminants that may be present in source water include:

- *Microbial contaminants* are viruses and bacteria from waste-water treatment plants, septic systems, agricultural activity, or wildlife;
- *Inorganic contaminants* are salts and metals that occur naturally or result from stormwater runoff, wastewater discharges, mining, farming, or oil and gas production;
- *Pesticides* and herbicides come from agricultural activity, stormwater runoff, or residential use;
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals, are byproducts of industrial processes and petroleum production, gas stations, stormwater runoff, agricultural activity, or septic systems; and,
- *Radioactive contaminants* that are naturally occurring, the result of mining activities or oil and gas production.

Key Water Quality Terms

Following are definitions of key terms noted on the adjacent water quality data table. These terms refer to the standards and goals for water quality described below:

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2009. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. If ingested, these parasites may produce symptoms of nausea, stomach cramps, diarrhea, and associated headaches.

Indoor Water Use Efficiency and Conservation Ordinance

Daly City Municipal Code 15.66 became effective on March 10, 2010. The ordinance addresses two public policy challenges. The first challenge is the supply limit amount of 4.292 million gallons of water a day set by the San Francisco Regional Water System. The second challenge is the enactment of a new state law requiring local agencies to conserve additional water and to enforce new indoor water use efficiency standards.

A few easy life-style shifts that save water and lower your water bill include:

- Turning off the faucet when you are brushing your teeth or doing dishes;
- Taking shorter showers;
- Using a broom to clean sidewalks or driveways;
- Operating your washing machine and dishwasher with full loads; and,
- Using a shut off hose nozzle (free to local residents) when you wash your car.

Free Water Conservation Devices and Cash Rebates

To assist our customers in voluntary conservation efforts, the Department of Water and Wastewater Resources offers a variety of free water saving devices, publications, rebates and school programs for residents, commercial users and students. For more information contact Cynthia Royer at (650) 991-8203 or by email at: **croyer@dalycity.org**.

For additional water conservation information, click on: www.dalycity.org/conserve

Water Main Flushing Program

Daly City staff routinely flushes water mains throughout the City in order to maintain water quality and remove sediment from the water distribution system. Sediment and rust can collect in water mains. This can discolor water, cause undesirable tastes and odors, and over time impede the flow of water through the main. The mains are flushed by operating valves in the street and opening hydrants to force the flow of water in one direction to properly flush the water main. The flushed water is dechlorinated and, if possible, directed to a landscaped area. The flushing continues until the water flowing out of the hydrant runs clear. Visit **www.dalycity.org** for more information.

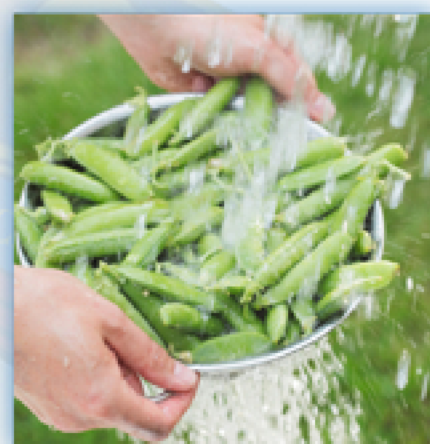
Drinking Water Source Assessment

In March 2003 a drinking water source assessment was completed, and five of Daly City's six municipal production wells assessed were noted as being highly protected from potential pathways of contamination. Well #4 was noted as being moderately protected. Daly City's municipal wells are considered most vulnerable to automotive repair activities, roadway contaminants and railways.

A copy of the complete assessment is available from the CDPH Drinking Water Field Operations Branch, 850 Marina Bay Parkway, Building P, 2nd Floor, Richmond, CA 94804. You may also obtain a summary of the assessment by contacting either CDPH District Engineer Eric Lacy at (510) 620-3453, or Daly City's Director of Water and Wastewater Resources Patrick Sweetland at **(650) 991-8200.**

Fluoridation Program

The San Francisco Public Utilities Commission has fluoridated drinking water for more than fifty years. Since June 2004, Daly City fluoridates the blended water supply throughout the entire community in keeping with the optimum level established by the CDPH.



Special Health Needs

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people undergoing chemotherapy or organ transplants, having immune system disorders, some elderly and infants can be particularly at risk from infection. These individuals should seek advice about drinking water from their health care providers. Guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800) 426-4791 or at: **www.epa.gov/safewater**

City of Daly City
Department of Water and Wastewater Resources
153 Lake Merced Boulevard
Daly City, CA 94015

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Contacts for Your Questions

For questions regarding:

- Your water bill and starting or stopping service: contact *Utility Billing* at **(650) 991-8082**.
- Leaks, service problems, water quality information, technical data or any other water related questions: contact the *Department of Water and Wastewater Resources* at **(650) 991-8200**.
- This report: contact Patrick Sweetland, Director of the *Department of Water and Wastewater Resources*, at **(650) 991-8200** for other questions related to this report.

If English is Not Your Primary Language

This report contains important information regarding your health and drinking water. Call the Daly City Water and Wastewater Resources Department **(650) 991-8200** should you require assistance in Chinese, Spanish, or Tagalog.

Este reporte contiene información muy importante de su salud y el agua que toma. Llame a Daly City Water and Wastewater Resources Department a **(650) 991-8200** si necesita asistencia en Español.

此報告包括有關您的健康和食水的重要資料。如需華語協助，請來電大利市水務及廢水資源部，電話 **(650) 991-8200**。

Ang ulat na ito ay naglalaman ng mahalagang impormasyon tungkol sa inyong kalusugan at sa inumin ninyong tubig. Mangyari po lamang na tawagan ang Daly City Water and Wastewater Resources Department sa numero **(650) 991-8200** kung kinakailangan ninyo ng tulong o interpretasyon sa wikang Tagalog.

(Data based on Hetch Hetchy water and effluents from both SVWTP and HTWTP)

City of Millbrae - Water Quality Data for Year 2010(1)

DETECTED CONTAMINANTS	Unit	MCL	PHG or (MCLG)	Range or Level Found	Average or [Max]	Major Sources in Drinking Water
TURBIDITY						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.6 (2)	[4.9] (3)	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (4)	N/A	-	[0.54]	Soil runoff
	-	min 95% of samples ≤ 0.3 NTU (4)	N/A	97.6% - 100%	-	Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (4)	N/A	-	[0.19]	Soil runoff
	-	min 95% of samples ≤ 0.3 NTU (4)	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR (SFPUC Regional System) - for information only						
Total Trihalomethanes	ppb	80	N/A	14 - 92	[40] (5)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	7 - 55	[25] (5)	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	TT	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
DISINFECTION BYPRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	10.4-59.3	24.5	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	3.7 - 34.3	13.1	Byproduct of drinking water chlorination
Total Organic Carbon (6)	ppm	N/A	N/A	NA	NA	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform (7)	-	≤ 5.0% of monthly samples	(0)	-	0	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	ND - 0.06	[0.06]	Naturally present in the environment
INORGANIC CHEMICALS						
Fluoride (source water) (8)	ppm	2.0	1	ND - 0.7	0.3 (9)	Erosion of natural deposits
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	1.1 - 2,4	2.00 MGL	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	Range	Average	Typical Sources of Contaminant
Chloride	ppm	500	N/A	3 - 16	9.5	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	N/A	33 - 316	179	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.6 - 38.7	18.2	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	27 - 174	95	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.07 - 0.33	0.16	Soil runoff

LEAD AND COPPER	Unit	AL	PHG	Range	90th Percentile	Typical Sources in Drinking Water
Copper	ppb	1300	300	10-120	<50	Corrosion of household plumbing systems
Lead	ppb	15	0.2	2 - 7	4	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as $CaCO_3$)	ppm	N/A	8 - 98	49
Bromide	ppb	N/A	<10 - 17	<10
Calcium (as Ca)	ppm	N/A	2 - 26	12
Chlorate (12)	ppb	(800) NL	92 - 357	150
Hardness (as $CaCO_3$)	ppm	N/A	8 - 104	53
Magnesium	ppm	N/A	0.3 - 9	4.6
pH	-	N/A	8.2 - 8.7	8.5
Potassium	ppm	N/A	0.34 - 1.2	0.6
Silica	ppm	N/A	4.1 - 7.6	5.7
Sodium	ppm	N/A	3 - 22	13

KEY:	
< / ≤	= less than / less than or equal to
AL	= Action Level
Max	= Maximum
Min	= Minimum
N/A	= Not Available
ND	= Non-detect
NL	= Notification Level
NTU	= Nephelometric Turbidity Unit
ORL	= Other Regulatory Level
ppb	= part per billion
ppm	= part per million
µS/cm	= microSiemens / centimeter

Notes:

(1) All results met State and Federal drinking water health standards.
(2) Turbidity is measured every four hours. These are monthly average turbidity values.
(3) This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipelines. The turbidity spike was not observed further downstream at Alameda East.
(4) There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.
(5) This is the highest quarterly running annual average value.
(6) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.
(8) The SFPUC adds fluoride to the naturally occurring level to help prevent dental caries in consumers. The CDPH requires our fluoride levels in the treated water to be maintained within a range of 0.8 ppm - 1.5 ppm. In 2010, the range and average of our fluoride levels were 0.6 ppm - 1.5 ppm and 1.0 ppm, respectively.
(9) The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water were ND and 0.15 ppm, respectively. The HTWTP raw water had elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into the Lower Crystal Springs Reservoir, which supplies water via the San Andreas Reservoir to the HTWTP for treatment.
(10) The most recent Lead and Copper Rule monitoring was in 2010. 0 of 30 water samples collected at consumer taps had copper concentrations above the Action Level.
(11) The most recent Lead and Copper Rule monitoring was in 2010. 1 of 30 water samples collected at consumer taps had lead concentrations above the Action Level.
(12) There were no chlorate detected in the raw water sources except the Crystal Springs and San Andreas reservoirs, where the detected chlorate were 81 ppb and 57 ppb, respectively. The chlorate levels in both reservoirs are due to the transfer of the disinfected Hetch Hetchy water and SVWTP effluent into the Crystal Springs Reservoir. The detected chlorate in treated water is a degradation byproduct of sodium hypochlorite, the primary disinfectant used by SFPUC for water disinfection.

Note: Additional water quality data may be obtained by calling the City of Millbrae water system phone number.650-259-2375

What does this table mean?

This table shows the results of our water quality analysis for 2010. It contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health (PHG), the amount detected, the typical sources of such contamination, footnotes to explain our findings and a key to the units of measurement.

Key Water Quality Terms

Following are definitions of key terms noted on the adjacent water quality data table. These terms refer to the standards and goals for water quality.

Public Health Goal (PHG)
The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG)
The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL)
The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL)
The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG)
The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS)
MCLs and MRDLs for contaminants that affect health along with their monitoring, reporting requirements, and water treatment requirements.

Treatment Technique (TT)
A required process intended to reduce the level of a contaminant in drinking water.

Turbidity
A water clarity indicator that is also used to indicate the effectiveness of the filtration plants. High turbidity can hinder the effectiveness of disinfectants.

Regulatory Action Level
The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

MILLBRAE WATER
2010
QUALITY REPORT

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Maintaining Water Quality in Your Home or Business

Customers can help to maintain a high standard of water quality, too. By following the simple measures described below you can help to prevent contamination of your water.

Hot water heaters: Flush the water heater tank through the drain outlet at the bottom annually.

Cross-connections: Some water users have contaminated their drinking water by creating cross connections that can siphon toxic fluids into their plumbing system. You can prevent them by:

1. Install anti-siphon fittings on all outside faucets.
2. Depressurize all hoses when not in use.
3. Remove any garden aspirator-type sprayers <u>immediately</u> after using.
4. Disconnect all hoses extending from the faucet into the sink.

Sinks: Clean faucet aerators regularly.

Thank you for your efforts to conserve water use by at least 10 percent. This will also save money on your bills.

Tips for reducing your water use:

1. Install a low flow showerhead and take 5-minute or less showers. Free showerheads and timers are available.
2. Catch water in a watering can or a bucket while waiting for water to get hot.
3. Replace your toilet with a high-efficiency model or put a water displacement bag in each toilet tank. Rebates are available for qualifying high-efficiency models.
4. Fix all leaky toilets, faucets and pipes. Install low flow faucet aerators in the kitchen and bathroom. Free low flow aerators are available.
5. Scrape plates and run the garbage disposal less frequently. Compost food scraps instead.
6. Turn off the water while brushing your teeth.
7. Run only full loads in dishwashers and clothes washers. Replace these appliances with water efficient machines. Rebates are available for qualifying high-efficiency clothes washer models.
8. Water lawn/landscapes between 6:00 pm and 10:00 am. Be sure not to over water landscaping. Check and adjust sprinkler heads seasonally. Plant drought-tolerant and native plants.
9. Use a carwash facility or bucket of water and one short rinse to wash your car; wash on a permeable surface (grass or gravel).
10. Sweep (never hose) driveways, patios and sidewalks.

Look online at www.ci.millbrae.ca.us/waterconservation or call the Water Resources & Conservation Program at (650) 259-2348 for more information on free water saving devices, high efficiency clothes washer and toilet rebates and workshops.

FOR MORE INFORMATION

United States Environmental Protection Agency
Safe Drinking Water Hotline: **(800) 426-4791**
Website: **http://www.epa.gov/safewater/hotline**

California Department of Public Health
Home Treatment Devices:
Drinking Water Treatment Device Certification Unit **(916) 449-5600**
Website:
http://www.cdph.ca.gov/certlic/device/Pages/watertreatmentdevices.aspx

San Francisco Public Utilities Commission
Water Supply & Treatment Division, Dispatch Line: **(650) 872-5900**
Customer Services: **(415) 551-3000**
Website: **http://www.sfwater.org**

City of Millbrae
Ronnald Popp, Public Works Director: **(650) 259-2339**
Mike Riddell, Public Works Utilities & Operations Superintendent: **(650) 259-2374**
Website: **http://www.ci.millbrae.ca.us**

For more information about the contents of this report, contact Mike Riddell at (650) 259-2374 or visit us online at **http://www.ci.millbrae.ca.us**. Water quality policies are decided at public hearings held at Millbrae City Hall, Council Chambers, 621 Magnolia Ave, Millbrae, CA 94030. For more information visit **www.ci.millbrae.ca.us.**

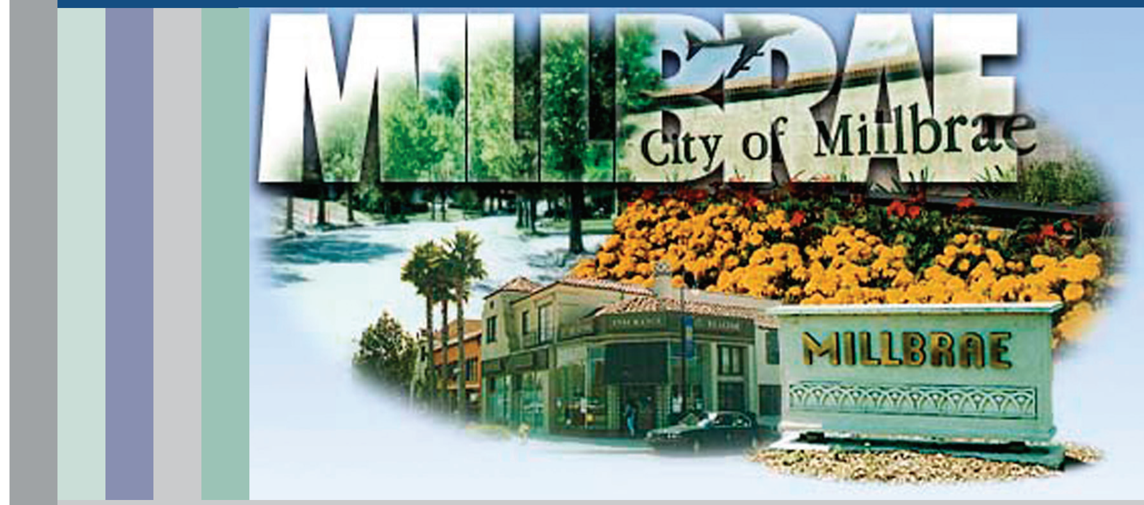
Translation Languages

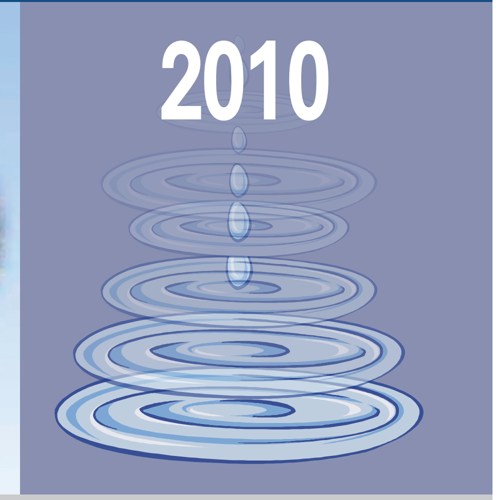
This report contains important information about your drinking water. Translate it, or speak with someone who understands it.
Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.
Para ver una versión en español, visite nuestro sitio web en www.sfwater.org/quality

此份有关你的食水报告,内有重要资料和讯息,请找
他人为你翻译及解释清楚。

この情報は重要です。
翻訳を依頼してください。

MILLBRAE WATER QUALITY REPORT





A MESSAGE FROM YOUR WATER DIVISION

The City of Millbrae/Public Works/Utilities & Operations

We present to you the City of Millbrae 2010 water quality report. Pursuant to federal regulations mandated by the Safe Drinking Water Act, all water consumers are to be provided annual information about their water and its sources.

We hope that this report will give you all of the information you may need regarding your water resources. We want our customers to know the origin of their drinking water supply, the specifics of the treatment(s) that it receives, and the results of water quality monitoring reports performed daily by the City of Millbrae, Public Works, Utilities and Operations staff and the San Francisco Public Utilities Commission (SFPUC). This data should offer you, the reader, a good working knowledge about Millbrae's water-related issues.

The City of Millbrae also endeavors to inform its water customers about the challenges we face and the efforts we perform in order to continuously provide water quality of the highest caliber.

Furthermore, we would like to encourage all water consumers to play an active role in the vital decisions that are made to protect our water resources and to ensure the quality of the water supply that is delivered to all homes and businesses in Millbrae.

We believe it is in everyone's interest to obtain a high quality and reliable water supply because it is integral to personal health, environmental integrity and community prosperity.

WATER QUALITY AND YOU

Water quality is extremely important, because we cannot survive without a clean and reliable source of it. We all have read and heard news reports in the past detailing many different occurrences of contaminants in water resources. For example, chemicals (like endocrine disruptors, such as PCB's and phthalates), disinfection by-products (like trihalomethanes (THMs) and haloacetic acids (HAAs)) and trace amounts of various pharmaceuticals have been discovered. In addition, the continued threat of terrorist attacks against public water supplies and infrastructure has added to society's concerns about the safety of drinking water supplies.

As challenges like these come out in the media, our customers can take the opportunity to become better informed about the quality of their water supply. The City of Millbrae; our water supplier, the San Francisco Public Utilities Commission (SFPUC); the California Department of Public Health (CDPH); and the United States Environmental Protection Agency (USEPA) are all working simultaneously to enure the highest quality water and to educate water consumers and to encourage their involvement in relevant decisions. Consumers who familiarize themselves with the basic drinking water information contained in this report will be able to participate more effectively in these decision-making processes. Together, we can be a great force to promote programs that will aid us in continuing to deliver water that meets the highest possible standards.

<u>One way you can get more involved in the water quality conversation:</u>
You are invited to attend Public Meetings held by the SFPUC. Meetings are held on the second and fourth Tuesdays of each month in City Hall, Room 400, 1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102. They are scheduled to begin at 1:30 PM. Contact the Commission at (415) 554-3165 for more information about the meetings.

The following websites provide information on water resources. We encourage you to visit these sites.

City of Millbrae, Millbrae, CA
http://www.ci.millbrae.ca.us
The City of Millbrae's website remains an invaluable source to the public on information about our city and projects. In relation to water resources, check out the pages on Utilities and Operations, the Water Pollution Control Plant, and other city programs, like: Recycling and Waste Prevention, and Water Conservation.

San Francisco Public Utilities Commission (SFPUC)
http://www.sfwater.org
The San Francisco Public Utilities Commission (SFPUC) provides drinking water to the City of Millbrae. Their website hosts the 2009 SFPUC Water Quality Report, statistics on our water supply, tips for water conservation practices, and information about natural resources.

United States Environmental Protection Agency (USEPA)
http://www.epa.gov
The United States Environmental Protection Agency (USEPA) is the federal government entity responsible for writing and enforcing environmental regulations in the country. Check out their website for information on many different topics, including water.

American Water Works Association (AWWA)
http://www.awwa.org
This website has many interesting sections; for instance, one can find local water utility information (under "Water Community Links"), gain access to the Association's "Water Library" and read water-related "Breaking News".

California Department of Public Health (CDPH)
http://www.cdph.ca.gov
This state agency works to protect public health in California and its website contains multiple resources including water quality information. Of interest, is a CDPH service entitled, "Decisions Pending & Opportunities for Public Participation" as well as links to other programs, like the Drinking Water Program.

Our Mission: Quality Water

The City of Millbrae, along with the San Francisco Public Utilities Commission (SFPUC), is pleased to present our 2010 Annual Consumer Confidence Report. This brochure offers a snapshot of the quality of water we provide to you throughout the year. We hope that it will give you all of the information you may need about your water resources. We want our customers to know the origin of their drinking water supply, the specifics of the treatment(s) that it receives, and the results of water quality monitoring reports performed daily by the City of Millbrae/Public Works/Utilities and Operations staff and the SFPUC.

Water Source Information

San Francisco Public Utilities Commission (SFPUC) is the sole provider of drinking water to Millbrae, its citizens and businesses. The map below shows how water is delivered to our City by the SFPUC.

SFPUC Drinking Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells. For the SFPUC system, the major water source originates from spring snowmelt flowing down the Tuolumne River to the **Hetch Hetchy Reservoir**, where it is stored. This pristine Sierra water source meets all federal and state criteria for watershed protection. The SFPUC also maintains stringent disinfection treatment practices, extensive bacteriological-quality monitoring, and high operational standards. As a result, the California Department of Public Health and United States Environmental Protection Agency (USEPA) have granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that the SFPUC is not required to filter water from the Hetch Hetchy Reservoir.

The Hetch Hetchy is supplemented with surface water from two local watersheds. Rainfall and runoff from the **Alameda Watershed**, spanning more than 35,000 acres in Alameda and Santa Clara Counties are collected in the Calaveras and San Antonio reservoirs and treated at the Sunol Valley Water Treatment Plant before distribution. Rainfall and runoff from the 23,000 acre **Peninsula Watershed** in San Mateo County are stored in Crystal Springs, San Andreas, and Pilarcitos reservoirs and treated at the Harry Tracy Water Treatment Plant before distribution.

In 2010, the Hetch Hetchy Watershed provided the majority of our total water supply, with the remainder contributed by the local watersheds.

Protecting Our Watersheds

The SFPUC aggressively protects the natural water resources entrusted to its care. Its annual Hetch Hetchy Watershed survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities by the SFPUC and its partner agencies, including the National Park Service, to reduce or eliminate contamination sources. The SFPUC also conducts sanitary surveys of the local Alameda and Peninsula watersheds every five years. These surveys identified wildlife and human activity as potential contamination sources. The reports are available for review at the CDPH's San Francisco District office **(510-620-3474)**.

Millbrae Water Distribution System

The City of Millbrae water system is fortunate to have two independent sources flowing to us from the SFPUC system. The Hetch Hetchy aqueducts run from south to north, generally along El Camino Real and Magnolia Avenue. They provide water to our customers in the gray shaded area between the San Francisco Bay and the areas that are approximately 100-feet above sea level. The blue shaded area indicates the area supplied by the Harry Tracy Water Treatment Plant (located at the upper right corner of the City of Millbrae map).

Water Quality: Contaminants and Regulations

The SFPUC's Water Quality Division regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2010, Water Quality staff conducted more than **58,750** drinking water tests in the transmission and distribution systems. This monitoring effort is in addition to the extensive treatment process control monitoring performed by our certified and knowledgeable treatment plant staff and online instruments.

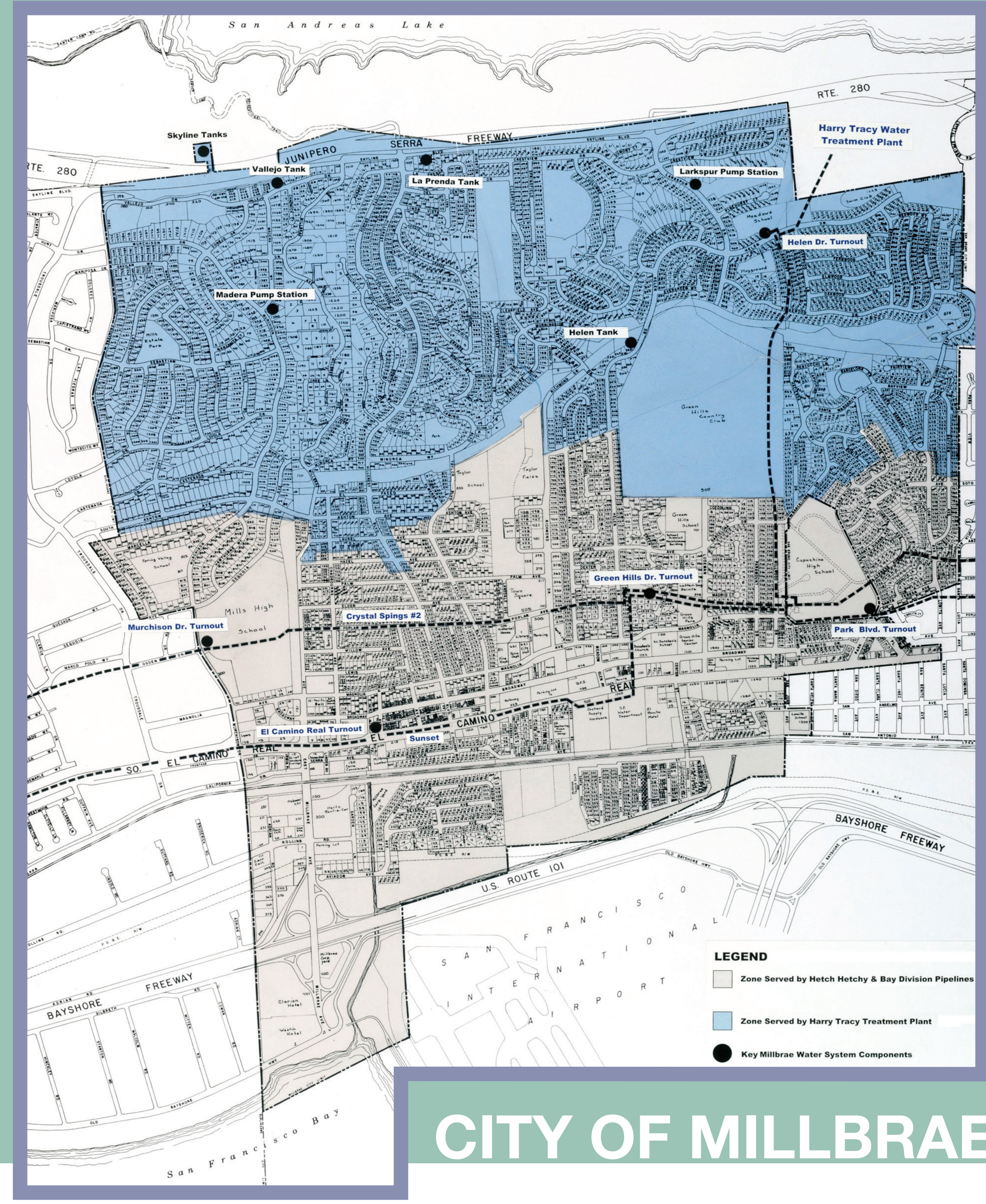
As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

In order to ensure that tap water is safe to drink, the USEPA and California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at **800-426-4791**.

Water Quality Data For Year 2010

The table on the back of this brochure lists all 2010 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits are not shown, in accordance with the CDPH guidance.

(Note: The CDPH allows the SFPUC to monitor for some contaminants less than once per year because their concentrations do not change frequently. The SFPUC received from the CDPH a monitoring waiver for some contaminants that were absent in the water.)



CITY OF MILLBRAE

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic Chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants that can be naturally occurring or be the result of oil and gas production and mining activities.

Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2010. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at **800-426-4791** or at **www.epa.gov/safewater**.

Fluoridation of Drinking Water

In 2010, water supplied to the City of Millbrae was fluoridated at less than 1 part per million (ppm), the level prescribed by the State. In addition, the SFPUC has added fluoride to its drinking water for over 50 years in order to prevent dental tooth decay.

Reducing Lead from Plumbing Fixtures

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Millbrae Water System is responsible for providing high-quality drinking water, but cannot control the variety of materials used in your household or building plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at **800-426-4791**, or at **www.epa.gov/safewater/lead**.

Lead and Copper Monitoring

In addition, the City of Millbrae follows a CDPH approved "reduced triennial monitoring frequency" schedule for measuring levels of lead and copper. This means we are consistently below the maximum contaminant level for both of these inorganic elements. Results from our 2010 tests validate this classification, because the City continues to be well within all required standards concerning lead and copper. The City of Millbrae plans to monitor for lead and copper again in 2013.

Drinking Water Regulations

In 2004, the USEPA proposed two new rules requiring water systems to enhance their existing efforts in reducing Cryptosporidium and Disinfection By-Products. The Long Term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfection By-Product Rule have imposed additional monitoring and disinfection requirements for the City of Millbrae. The City continues to monitor and to report data under the Disinfection By-Product Rule.

Earthquake Readiness

The City of Millbrae Water Division would like to remind you to prepare your home with emergency provisions, including a three-to-five-day supply of drinking water for every member of your household.

- Store tap water-at least one gallon per person per day (don't forget water for pets, too!) in clean, plastic, airtight containers in a dark, cool place.
- Store enough to last at least three to five days.
- Label each container with a date and replace the water every six months.
- At the time of usage, add 16 drops of bleach to each gallon to ensure disinfection (use pure household bleach only- not products with scents or other additives.) Mix and allow it to stand for 30 minutes before each use. If a camp stove is available, you can also disinfect the water by bringing it to a rolling boil for 5 to 10 minutes.
- If you run out of stored drinking water, strain and treat water from your water heater. To strain, pour it through a clean cloth or layers of paper towels. Treat with household bleach, as directed above. Other sources of water inside the home are ice cubes, and the reservoir tank of your toilet (not the bowl).
- If your water supply is not sufficient for hand washing, use antiseptic hand gel or wipes.

For more information visit www.sfwater.org, www.72hours.org or contact the City of Millbrae, your water provider, at www.ci.millbrae.ca.us.

Millbrae Water Quality Assurance Programs

The Millbrae water division conducts a comprehensive water quality assurance program. We collect and report over forty samples a month throughout our system to regularly monitor water quality. We send samples to a state certified laboratory for testing. We are pleased to report that all samples have tested negative for coliforms and that the City had zero violations related to any maximum contaminant level (MCL) in the calendar year 2010.

Other water samples are collected periodically to check for levels of lead and copper, disinfection by-products [trihalomethanes and haloacetic acids - THMs and HAAs] and general physical components as required by state and federal regulations. The City of Millbrae received a waiver for asbestos sampling.

The City of Millbrae continually monitors all five main entry points to our distribution system and also other key points in the distribution system such as our tank sites and pump stations. These sites are monitored by our computerized SCADA (Supervisory Control and Data Acquisition) system that provides our water division managers with continuous automated water quality information.

The Millbrae water division maintenance staff flushes dead-end main pipes located throughout the city on a quarterly schedule (minimum) to ensure our water mains remain clean. We also manage a capital replacement program which progressively and continually ensures our water main pipes and lines remain in top order. These programs assure that water is reliably delivered at the highest quality possible.

In addition, the Millbrae water division, along with the San Mateo County Environmental Health Department, administers and manages a cross-connection prevention program to eliminate possible contamination to our drinking water through backflow prevention devices. The program includes yearly testing of all city-owned backflow devices and monitoring of compliance on privately owned backflow devices*.

*A note to those residents and business owners who have backflow prevention devices: State regulations require that all backflow prevention devices be tested annually by a certified inspector.

In 2010, the City began the design phase of an enclosure around the Larkspur Water Pump Station and construction should take place in 2011. Also, the design of the interior and exterior storage tank recoating and painting has commenced. Geotechnical work is progressing on the project and is expected to be completed in the summer of 2011. The recoating and painting work should begin soon after in the fall of 2011.

ANNUAL

WATER QUALITY REPORT

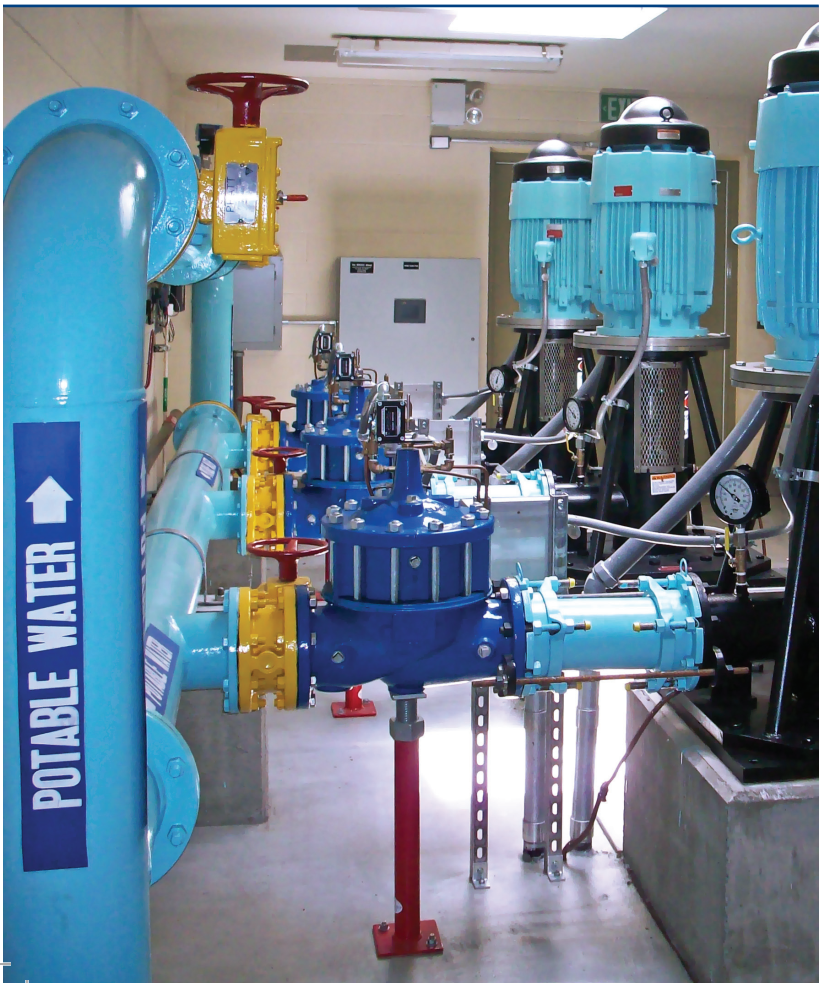
2010

Where City's Water Comes From

Throughout this report customers will be able to find useful information specifically related to the City of San Bruno water system, as well as information related to drinking water in general. The primary mission of this report is to summarize the past year's water quality data that are found in the tables at the end of this brochure. You will also find valuable information about City's current operations as well as future changes or improvements to the water system. The City of San Bruno continues its commitment to provide you with safe, high quality drinking water.

Sources of The City's Water

The supply of water for the City of San Bruno is derived from two primary sources, surface water and deep wells. Groundwater from the City's five wells is blended throughout the distribution system with water purchased from the San Francisco Public Utilities Commission (SFPUC). The sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells. For the SFPUC system, the major water source originates from spring snowmelt flowing down the Tuolumne River to the Hetch Hetchy Reservoir, where it is stored. This pristine Sierra water source meets all federal and state criteria for watershed protection. The SFPUC also maintains stringent disinfection treatment practices, extensive bacteriological-quality monitoring, and high operational standards. As a result, the California Department of Public Health and USEPA have granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that the SFPUC is not required to filter water from the Hetch Hetchy Reservoir.



The Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff from the Alameda Watershed, spanning more than 35,000 acres in Alameda and Santa Clara counties, are collected in the Calaveras and San Antonio reservoirs and treated at the Sunol Valley Water Treatment Plant before distribution. Rainfall and runoff from the 23,000-acre Peninsula Watershed in San Mateo County are stored in Crystal Springs, San Andreas, and Pilarcitos reservoirs and treated at the Harry Tracy Water Treatment Plant before distribution.

In 2010, the Hetch Hetchy Watershed provided the majority of our total water supply, with the remainder contributed by the local watersheds.

Safeguarding City water supply

Securing the City's water facilities is a top priority. Residents can be assured that the City of San Bruno is taking precautions to protect the public water supply against a possible terrorist attack. We are working with law enforcement agencies, public health officials, other water utilities, and the Department of Homeland Security to ensure City's water supply is protected.

Source Protection

Source protection is the primary barrier, the first line of defense against contamination of your drinking water at its source. Hetch Hetchy Reservoir, which is the largest reservoir in the SFPUC system, is located in Yosemite National Park. This reservoir provides approximately 94 percent of the total water supply to all twenty-nine Bay Area wholesale costumers. Spring snowmelt flows down the Tuolumne River and fills the reservoir. The high quality Hetch Hetchy water supply meets all federal and state criteria for watershed protection, disinfection treatment, bacteriological quality and operational standards. The SFPUC strictly controls activities on the watershed lands around their reservoirs, limiting activities to those compatible with maximum protection of the water quality.

Protecting Our Watersheds

The SFPUC aggressively protects the natural water resources entrusted to its care. Its annual Hetch Hetchy Watershed survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities by the SFPUC and its partner agencies, including the National Park Service, to reduce or eliminate contamination sources.

The SFPUC also conducts sanitary surveys of the local Alameda and Peninsula watersheds every five years. These surveys identified wildlife and human activity as potential contamination sources.

The reports are available for review at the CDPH's San Francisco District office (510-620-3474).

San Bruno's groundwater is drawn from a deep aquifer more than 200 feet below the surface. It is protected from contamination by impervious layers of clay deep in the ground. The soil layers filter contaminants borne by surface water and shallow groundwater that may eventually reach the aquifer over several centuries of time before it reaches the well locations. The wells are constructed to meet strict standards imposed by San Mateo County Environmental Health Division to ensure that no surface water or shallow groundwater can enter the aquifer at those points. In cooperation with San Mateo County Environmental Health Division, San Bruno participates in a wellhead protection program established to ensure the long-term protection of the quality of San Bruno's groundwater resources.

Source water assessments were conducted for the City of San Bruno water system in June, 2008.
The sources are considered most vulnerable to the following activities not associated with any detected contaminants: Automobile - Repair shops, Sewer collection systems, Military installations, Utility stations - maintenance areas and Dry cleaners.

Possible Contaminating Activities (PCA) See Web site **http://swap.ice.ucdavis.edu/TSinfo/TSsearch.asp**

Water Treatment

Water treatment is the next layer of protection of the City's drinking water. Throughout 2010, the City's well water was disinfected with chloramine, a combination of chlorine and ammonia at the wellhead.
Also, City well water is sampled daily to ensure the health and safety of City's consumers. In addition, the City's Lions Field Well and Forest Lane Well are equipped with a filtering plant to remove iron and manganese and adjust pH levels prior to distribution to City's customers. This is to ensure that water from this particular well meets or exceeds all Drinking Water Standards as set by the California Department of Public Health (CDPH).

Water System Operations

Effective operation and maintenance of the distribution system ensures that the water maintains its quality as it travels through the system to your tap. The disinfectant residual in the water after treatment prevents the regrowth of microbial organisms during storage and transmission of water in the distribution system. The flushing of City's water mains and rotation of stored supplies also keeps the water fresh and limits the possibility for growth of such organisms. City of San Bruno conducts mandatory weekly water quality testing of the distribution system to ensure that the City's drinking water continues to be safe and healthy.

The City of San Bruno also maintains an active cross connection control program to prevent the intrusion of potentially harmful materials into the drinking water system. Cross connection control is done by isolating hazards such as boilers, cooling towers, and fire sprinklers from the drinking water supply by installing approved backflow prevention devices.

Fluoride in the City's Drinking Water

Water supplied to The City of San Bruno by the SFPUC has been fluoridated since 1965. SFPUC completed a new fluoridation facility in the East Bay in September 2005; the SFPUC fluoridates the drinking water of its entire suburban wholesale service area to protect their customers' dental health. Because the SFPUC water supply that the City of San Bruno purchases is blended with the City's well water that is non-fluoridated, the water that you receive at your home may contain fluoride that is below the optimal level.

For more information about fluoride, contact your water service provider, or visit the SFPUC website at sfwater.org/fluoride. Local county health departments are also a good source of information about fluoride. Here are some phone numbers you may call:

SFPUC Fluoride Information Line	**(866) 668-6008**
San Mateo County Health Department	**(650) 372-8572**
County of Santa Clara Health Department	**(408) 885-3980**

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline 800-426-4791 or at **www.epa.gov/safewater.**

Water Quality: Contaminants and Regulations

The SFPUC's Water Quality Division regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2010, Water Quality staff conducted more than **58,750** drinking water tests in the transmission and distribution systems. This monitoring effort is in addition to the extensive treatment process control monitoring performed by our certified and knowledgeable treatment plant staff and online instruments. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline 800-426-4791.

Water Quality Data for Year 2010

The adjacent table below lists drinking water contaminants detected in 2010. Contaminants below detection limits are not shown. In addition to the contaminants' names, applicable drinking water standards or regulatory action levels, ideal goals for public health, and levels detected in water, the table also includes the information about the typical contaminant sources and footnotes explaining the findings..The State allows the SFPUC to monitor for some contaminants less than once per year because their concentrations do not change frequently. The SFPUC received from the State a monitoring waiver for some contaminants that were absent in the water.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides** that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- **Radioactive contaminants**, that can be naturally occurring or be the result of oil and gas production and mining activities.

Unregulated Contaminant Monitoring helps the U.S. EPA and CDPH to determine where certain contaminants occur and whether the contaminants need to be regulated. During 2005, the SFPUC and the City of San Bruno monitored as many as twelve unregulated contaminants including MTBE, perchlorate, herbicides, and pesticides. These contaminants were not detected in any of SFPUC or City of San Bruno water supplies.

In making significant modifications to its disinfectant processes, the City integrated all of the disinfection equipment into its Supervisory Control and Date Acquisition (SCADA) system, thereby adding another level of safety to drinking water quality. Other improvements include pipelines, regulating stations, and an additional well that will further provide the system's managers with more flexibility and capacity to operate the system to the best advantage of the customer.

The City of San Bruno Nitrate Monitoring Requirements at Well No.16 were not met in 2010

In March 2010 water samples were taken at four City wells to meet the nitrate testing requirements of the California Department of Public Health (CDPH).

All samples were sent to the City's independent third-party laboratory for analysis. The laboratory unintentionally omitted the test results of the sample from Well No. 16. Because the absence of the test results was not immediately noticed by City employees, the City received a violation from the CDPH.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During 2010, we did not monitor or test for nitrate at Well No.16 and therefore, cannot be sure of the quality of our drinking water during that time.

Nitrate levels at all of the City wells including Well No.16 have always been far below the Maximum Contaminate Level (MCL) of 45 mg/l. However, failing to detect the laboratory's error resulted in water quality monitoring requirements not being met for 2010. Even though this failure was not an emergency and did not impact the quality of your water, as our customers, you have the right to know what happened and what we did to correct this situation.

1. The City took a new nitrate sample at Well No.16 on January 24, 2011. The sample results were 1.0 mg/l, far below the MCL of 45 mg/l.
2. The City has established a Corrective Action Plan that has been approved by the CDPH. The Correction Action Plan will help prevent any further sampling errors.

If you have any questions, please contact Water Systems and Conservation Manager Mark Reinhardt at (650) 616-7162.

What you should know about Cryptosporidium & Giardia Lamblia

Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2010. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants, including *Cryptosporidium* and *Giardia Lamblia*. The presence of small amounts of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects may be obtained by calling the U.S. EPA Safe Drinking Water Hotline at (800) 426-4791.

Check Records Arsenic

On February 22, 2002, a new arsenic standard was adopted by the USEPA, setting the allowable level of arsenic in drinking water at 10ppb. The level was lowered from the previous standard of 50 ppb, in light of new studies linking arsenic in water to bladder, lung and skin cancer, as well as kidney and liver cancer and other nervous and vascular system complications. The new rule requires that all water systems be in compliance by January 23, 2006.

Reducing Lead from Plumbing Fixtures

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of San Bruno Water System is responsible for providing high-quality drinking water, but cannot control the variety of materials used in your household or building plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline 800-426-4791, or at www.epa.gov/safewater/lead.

Definitions to Understand this Report

The table on the right lists all 2010 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits are not shown, in accord with the CDPH guidance.

Key Water Quality Terms

Following are definitions of key terms noted on the adjacent water quality data table. These terms refer to the standards and goals for water quality described below.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A water clarity indicator that is also used to indicate the effectiveness of the filtration plants. High turbidity can hinder the effectiveness of disinfectants.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2010. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of Cryptosporidium may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Secondary Drinking Water Standards (SDWS)
MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminations with SDWSs do not affect the health at the MCL levels.

Variances and Exemptions
Department permission to exceed an MCL or not comply with a treatment technique under certain conditions.

Waiver
State permission to decrease the monitoring frequency for a particular contaminant.

Additional Definitions:

ND: Not detectable at testing limit.

ppm: parts per million or milligrams per liter (mg/L)

ppb: parts per billion or micrograms per liter (ug/L)

pCi/L: picocuries per liter (a measure of radiation)

City of San Bruno Water Quality Data for Year 2010 [1]

DETECTED CONTAMINANTS	Unit	MCL	PHG or (MCLG)	SFPUC Range or Level Found	SFPUC Average or (Max)	San Bruno Range or Level Found	San Bruno Average or (Max)	Typical Sources in Drinking Water
TURBIDITY [2]								
For Unfiltered Hetch Hetchy Water	NTU	5	NA	0.2 - 0.6 [3]	[4.9] [4]			Soil run-off
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 [6]	NA	-	[0.54]			Soil run-off
	–	min 95% of samples ≤ 0.3 NTU [5]	NA	97.6% - 100%	-	NA		Soil run-off
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 [5]	NA	-	[0.19]			Soil run-off
	–	min 95% of samples ≤ 0.3 NTU [5]	NA	100%	-			Soil run-off
DISINFECTION BY-PRODUCTS								
Total Trihalomethanes (TTHMs)	ppb	80	NA	14 - 92	[40] [6]	<0.5 - 33.7	9.5 [6]	By-product of drinking water chlorination
Total Haloacetic Acids (HAAs)	ppb	60	NA	7 - 55	[25] [6]	<2 - 25.4	5.4 [6]	By-product of drinking water chlorination
Total Organic Carbon (TOC) [7]	ppm	TT	NA	2.4 - 3.2	2.7	NA	NA	Various natural and man-made sources
MICROBIOLOGICAL								
Total Coliform	%	≤ 5.0% of monthly samples	[0]	-	-	0	0	Naturally present in the environment
Giardia lamblia	cyst/L	TT	[0]	ND - 0.06	[0.06]	0	0	Naturally present in the environment
INORGANIC CHEMICALS								
Fluoride (source water) [8]	ppm	2.0	1	ND - 0.7	0.3 [9]	0.1 - 0.14	0.11	Erosion of natural deposits
Chlorine (including free chlorine and chloramine)	ppm	MRDL = 4.0	MRDLG = 4	1.8 - 2.4	2.0	2.5 - 2.8	2.5	Drinking water disinfectant added for treatment

CONSTITUENTS WITH SECONDARY STANDARDS	Unit	SMCL	PHG	SFPUC Range	SFPUC Average	San Bruno Range	San Bruno Average	Typical Sources in Drinking Water
Chloride	ppm	500	NA	3 - 16	9.5	58 - 110	79.45	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	0 - 5	3.75	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	NA	33 - 316	179	520 - 870	683.75	Substances that form ions when in water
Sulfate	ppm	500	NA	1.6 - 38.7	18.2	26 - 79	46.32	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	NA	27 - 174	95	300 - 480	383.5	Runoff / leaching from natural deposits
Turbidity	NTU	5	NA	0.07 - 0.33	0.16	0.1 - 58	0.46	Soil runoff
Iron	ppm	0.3	NA	ND	ND	0.01 - 0.03	15	Leaching from natural deposits
Manganese	ppm	0.05	NA	ND	ND	0.02 - 0.04	0.03	Leaching from natural deposits

LEAD AND COPPER RULE STUDY [11]	Unit	AL	PHG	SFPUC Range	SFPUC 90th Percentile	San Bruno Range	San Bruno 90th Percentile	Typical Sources in Drinking Water
Copper	ppb	1300	170	N/A	N/A	2.6 - 972	550	Corrosion of household plumbing systems
Lead	ppb	15	2	N/A	N/A	<1 - 3.2	1.8	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	Unit	ORL	SFPUC Range	SFPUC Average	San Bruno Range	San Bruno Average
Alkalinity (as $CaCO_3$)	ppm	NA	8 - 98	8 - 98	130 - 220	170
Boron	ppb	NA	<100 - 102	<100	ND	ND
Bromide	ppb	NA	<10 - 16	<10 - 17	0.1 - 0.5	0.4
Calcium (as Ca)	ppm	NA	2 - 26	12	31 - 99	54.75
Chlorate [10]	ppm	(800) NL	92 - 357	150	NA	NA
Hardness (as $CaCO_3$)	ppm	NA	8 - 104	53	170 - 310	225
Magnesium	ppm	NA	0.3 - 9	4.6	23 - 41	30.6
pH	-	NA	8.2 - 8.7	8.5	7.43 - 7.56	7.51
Potassium	ppm	NA	0.34 - 1.2	0.6	0 - 5.3	1.3
Silica	ppm	NA	4.1 - 7.6	5.7	NA	NA
Sodium	ppm	NA	3 - 22	13	40 - 58.2	48.3

KEY:		
< / ≤	=	less than / less than or equal to
AL	=	Action Level
Max	=	Maximum
NA	=	Not Available
ND	=	Non Detected
NL	=	Notification Level
NS	=	No Standard
NTU	=	Nephelometric Turbidity Unit
ORL	=	Other Regulatory Level
ppb	=	parts per billion
ppm	=	parts per million
TT	=	Treatment Technique
Min	=	Minimum
µS/cm	=	microSiemens / centimeter

(1) All results met State and Federal drinking water health standards.
(2) Turbidity is a water clarity indicator; it also indicates the effectiveness of the filtration plants.
(3) Turbidity is measured every four hours. These are monthly average turbidity values.
(4) This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipelines. The turbidity spike was not observed further downstream at Alameda East.
(5) There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations.
(6) This is the highest quarterly running annual average value.
(7) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.
(8) The SFPUC adds fluoride to the naturally occurring level to help prevent dental caries in consumers. The CDPH requires our fluoride levels in the treated water to be maintained within a range of 0.8 ppm - 1.5 ppm. In 2010, the range and average of our fluoride levels were 0.6 ppm - 1.5 ppm and 1.0 ppm, respectively.
(9) The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water were ND and 0.15 ppm, respectively. The HTWTP raw water had elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into the Lower Crystal Springs Reservoir, which supplies water via the San Andreas Reservoir to the HTWTP for treatment.
(10) There were no chlorate detected in the raw water sources except the Crystal Springs and San Andreas reservoirs, where the detected chlorate were 81 ppb and 57 ppb, respectively. The chlorate levels in both reservoirs are due to the transfer of the disinfected Hetch Hetchy water and SVWTP effluent into the Crystal Springs Reservoir. The detected chlorate in treated water is a degradation byproduct of sodium hypochlorite, the primary disinfectant used by SFPUC for water disinfection.
(11) Latest round of Lead and Copper Rule monitoring was in 2010.

Note: Additional water quality data may be obtained by calling the City of San Bruno Water Division at (650) 616-7162

Consumer Confidence Report

A public service provided by the City of San Bruno, the Peninsula City of choice in which to live, learn, work, shop and play.

The City of San Bruno is proud to provide our customers with the annual Consumer Confidence Report (CCR). This year's report is in compliance with new regulations of the 1998 Safe Drinking Water Act (SDWA) reauthorization, that charges the U.S. Environmental Protection Agency (U.S.EPA) with updating and strengthening the tap water regulatory program. This report presents water quality and supply information for 2010. During 2010, the City and the San Francisco Public Utilities Commission (SFPUC) monitored the water quality of both source and treated water supplies. The City of San Bruno wants you, our customer, to know that your water system has met all water quality standards established by the U.S.EPA and the California Department of Public Health (CDPH).

How Can the Public Be Involved?

Meetings of the City of San Bruno City Council begin at 7:00 PM on the second and fourth Tuesdays of each month and are open to the public. Meetings are held at the San Bruno Senior Center located at 1555 Crystal Springs Road.

If you have any questions or need further information, please feel free to contact the City of San Bruno Water Division at (650) 616-7162, or by mail at City of San Bruno Water Division, 567 El Camino Real, San Bruno, CA 94066-4247. A copy of the 2010 Consumer Confidence Report will also be posted on the City's website at www.sanbruno.ca.gov.

Decisions about SFPUC water quality issues are made from time to time in public meetings held at San Francisco City Hall, 1 Doctor Carlton B. Goodlett Place, Room 400, San Francisco CA 94102. Inquiries about these meetings may be directed to the Office of the Commission Secretary at (415) 554-3165. Additional information about the SFPUC water quality may be obtained by calling (877) 737-8297, or by going to their website at www.sfwater.org.

Tanslation Languages

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.
Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.
Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

此份有关你的食水报告,内有重要资料和讯息,请找
他人为你翻译及解释清楚。

City of San Bruno
Public Works Department
Water Division
567 El Camino Real
San Bruno, CA 94066-4247

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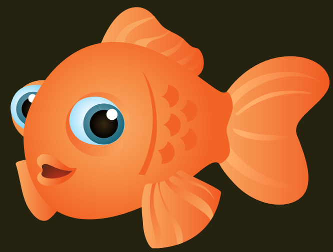
2010

Reliability and Quality

2010 Conservation Update
and Water Quality Report

Bayshore District
South San Francisco



Reliability and Quality Water is not just a thirst quencher — it's an essential, irreplaceable natural resource. In this report, you'll see how we can work together to ensure that we have a reliable supply for today and tomorrow. You'll also find important information about the quality of water we provide to you and your family.

Use Water Wisely. It's Essential.

About Your Water System

Cal Water has provided high-quality water utility services in South San Francisco since 1931. In 2009, water for our customers was purchased from the San Francisco Public Utilities Commission (SFPUC), and additional water was provided by five groundwater sources. Our South San Francisco system includes 144 miles of pipeline, 12 storage tanks, one collecting tank, and 20 booster pumps. Cal Water proactively maintains and upgrades its facilities to ensure a reliable, high-quality supply.

Bayshore District
341 North Delaware Street, San Mateo, CA 94401-1727
(650) 558-7800 infoBAY@calwater.com
www.calwater.com

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341 North Delaware Street
San Mateo, CA 94401-1727
(650) 558-7800
www.calwater.com

At California Water Service Company (Cal Water), we know the value of water. Water is the lifeblood of every community and an integral part of our lives. It does so much more than quench our thirst; it also enables us to stay clean, grow food, fight fires, and manufacture products. It is a precious, finite resource that we must conserve and protect. To that end, we provide information in the first part of this report to help you use water as efficiently as possible. We hope you will take advantage of the programs, free devices, and tips we offer to help you save water in your home.

After the conservation section, you'll find important facts about your water quality. We are committed to providing safe, high-quality water to you and your family. Inside, you'll get information about our rigorous monitoring and testing programs, and you will see how your water compares to state and federal water quality standards. **Most importantly, this report confirms that your water met or surpassed all primary and secondary water quality standards during this reporting period.**

If you have any questions, suggestions, or concerns, please contact our local Customer Center, either by phone or through the contact link on our web site. Also, please watch for bill inserts (which are also available online for customers using paperless billing), where you will find announcements of any water-related public meetings or workshops, as well as important information about your water. Additional information and time-sensitive announcements about your water can be found at www.calwater.com.

Sincerely,

Tony Carrasco

District Manager
Bayshore District

Conservation: It's Not Just for Droughts Anymore

If you've lived in California for any length of time, you know that droughts come and go. When droughts come, we're all pretty conscientious about our water use. When droughts go, it's easy to fall back into our water-wasting ways. But we can't afford to do that this time around, and here's why.

Growing Population We have the same amount of water today as we did when the dinosaurs roamed the earth, and yet, the state's population continues to grow.

Delta in Trouble Nearly two-thirds of Californians receive water transported through the Sacramento-San Joaquin Delta, and it's in trouble. The network of waterways and levees that make up the Delta need significant investment, and even then, flowing too much water through the Delta could hurt sensitive ecosystems.

Colorado River Must Be Shared We depend upon water from the Colorado River, but other states have claimed their share, and California has been ordered to reduce its take.

Groundwater Sustainability Groundwater is an important resource across the state. We need to reduce our use to ensure that we don't harm underground aquifers.

20 by 2020 In response to these challenges, the California Legislature passed a law in 2009 requiring a 20% reduction in per-person water use by 2020, with an interim required reduction of 10% by 2015.

Tiered Rates The California Public Utilities Commission has approved a tiered-rate structure to encourage Cal Water customers to conserve, which means when you use more, you pay more.

Conservation isn't difficult, but it is essential. Read on to see how you can help us ensure a reliable supply for you and for future generations.

Make a Big Impact in Your Own Backyard

A significant portion of urban residential water use — more than half in most cases — occurs outdoors. That means you can make a big difference by using water efficiently in your own backyard. It all boils down (no pun intended) to reducing evaporation, avoiding runoff, and watering only as much as your landscape needs.

- Select native plants whenever possible. Consult your local nursery or visit www.calwater.com for a list of water-friendly plants.
- Wait until fall or winter to plant. New plants require more water than established growth.
- Keep low-water-using plants away from "thirsty" plants.
- Keep shade plants in the shade. This will help prevent them from drying out.
- Place water-loving plants at the bottom of slopes where they will benefit from water runoff.
- Use mulch to reduce evaporation.
- Water at dawn or dusk, when temperatures are lower; also, be aware of any ordinance your city may have about when you can water.
- Install a rain sensor or turn off automatic sprinklers when it rains.
- Check your sprinklers regularly for broken heads, leaks, and overspray.
- Lawn requires more water than native plants, but if you do have grass, water it only when necessary; if you step on the grass and it springs right back up, it probably doesn't need water.

Save Water without Breaking a Sweat

No matter where you live — single-family home, duplex, condominium, or apartment — you have many opportunities to save water. And it's easy. Here are a few ways you can save water without breaking a sweat.

- Put your food waste into a compost pile or trash can instead of the garbage disposal, which requires flowing water.
- When you're making coffee, tea, or other water-based beverages, make only as much as you can drink. This not only saves the amount of water left in the pot, it also saves the water that is used to produce the coffee and tea in the first place.
- If you like to take baths (and who doesn't?), plug the tub before you start the water. Even if the water takes time to heat up, you can adjust the temperature as the water runs.
- If you have a pool, keep it covered when not in use.
- Never let water run right from the faucet to the drain. If you can't simply turn it off, maybe you can capture the water for later use somewhere else. Your ficus won't mind!
- Use a commercial car wash instead of washing your car yourself. Modern car washes are generally very water-efficient.
- You can find many more tips online in the Conservation section of www.calwater.com. If you have questions or a conservation tip of your own you'd like to share, please e-mail us at conservation@calwater.com.

Get a Conservation House Call

Could you use some help finding water-saving opportunities around your home? If you live in a single-family residence, why not sign up for a free residential water-use survey? You'll get expert advice with no strings attached — there's nothing to buy and no obligation to make any changes you don't want to make. If you sign up, on the day of your appointment, a trained water conservation specialist from WaterWise will come to your home and help you find ways to reduce your water usage.

For example, the specialist will:

- Show you how to read your meter and check for leaks.
- Check the flow rates of your faucet aerators and showerhead fixtures.
- Check for toilet leaks and measure your toilets' existing flush rate volumes.
- Provide information on rebates available for toilets, washing machines, and other high-efficiency appliances.
- Check the flow rates of your water-using appliances (such as clothes washers and dishwashers).
- Conduct a soil probe test in your yard to determine soil texture.
- Look for existing plumbing fixtures (such as showerheads, faucet aerators, and toilet flappers) that are using water inefficiently. If they qualify, the specialist will replace them with new, high-efficiency ones at no cost to you.
- Review your landscaping and recommend optimal watering methods and schedules.
- Check your sprinkler system and look for broken heads and/or lateral lines.
- Install water-efficient pop-up spray nozzles on your sprinklers, if your existing devices qualify for replacement, at no cost to you.

To take advantage of this free service, call our contractor, WaterWise, at (866) 685-2322. A representative will confirm your eligibility and schedule your survey.

Take Advantage of Available Rebates

To encourage water conservation in the home, Cal Water offers rebates on a number of qualified water-efficient appliances (available until funds are depleted).

High-efficiency toilet: (Rebate available when replacing a toilet using 3.5 gallons per flush or more) High-efficiency toilets (HETs) are defined as fixtures that flush at 20% below the 1.6-gallons-per-flush (gpf) U.S. maximum or less, equating to a maximum of 1.28 gpf. (The HET category includes dual-flush toilets). The average water savings for one HET is estimated to be 38 gallons per day (gpd).

High-efficiency clothes washer: High-efficiency clothes washers use 35-50% less water and approximately 50% less energy than traditional washers.

Cal Water offers these rebates through partnerships with the Bay Area Water Supply & Conservation Agency (BAWSCA) and PG&E. Additional rebates may be available. For more information, disclaimers, and application instructions, please see the Residential Rebates section of Cal Water's web site at www.calwater.com/conservation.

Request a Free Conservation Kit

Cal Water offers conservation kits to customers at no charge (while supplies last). These kits contain several items, including:

- High-efficiency showerheads with a flow rate of 2 gallons per minute,
- Kitchen faucet aerators with a flow rate of 1.5 gallons per minute,
- Bathroom faucet aerators with a flow rate of 1 gallon per minute,
- Hose shut-off nozzles, and
- Dye tablets to help you check for toilet leaks.

Visit www.calwater.com/kit to customize your kit and have it mailed to your service address.

If you are a property manager or require conservation supplies for multiple units or homes, e-mail your request to the Conservation Department at conservation@calwater.com.

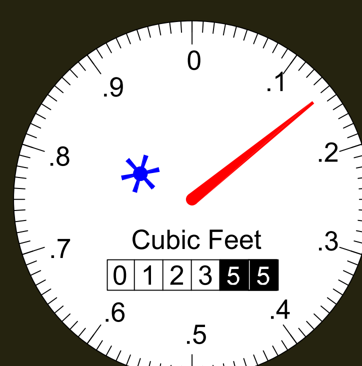
Fix a Leak and Save a Lot

Leaks are sneaky. They waste a lot of water and can have a real impact on your water bill. To check your home for leaks, begin by turning off all the faucets and water-using appliances in your home. Then locate your water meter (usually at the curb of your home) and watch the large test hand (in red in the accompanying picture) for about 15 minutes. If the hand moves during that time, you have a leak.

Leaks can occur in pipes, faucets, hoses, sprinkler systems, sprinkler timers, water softeners, water heaters, and water filtration units, but the most common culprit for indoor leaks is the toilet. To find out if your toilet leaks, listen for the sound of running water. You can also place a dye tablet (available at no charge through calwater.com) or a few drops of food coloring in the tank. Don't flush the toilet. If colored water makes its way into the bowl, the toilet is leaking.

Other indications of household leaks include:

- Dripping faucets
- Unusual wet spots in the house or yard
- Discoloration spreading on a ceiling
- Rooms that are unusually or unseasonably warm or humid
- A pool that loses water more quickly than it used to



It's up to Cal Water to fix leaks in the water system leading up to your meter, but it's up to you to take care of any leaks leading from the meter to your home. And the meter is a great place to start.

300,000 Steps to Ensuring Water Quality

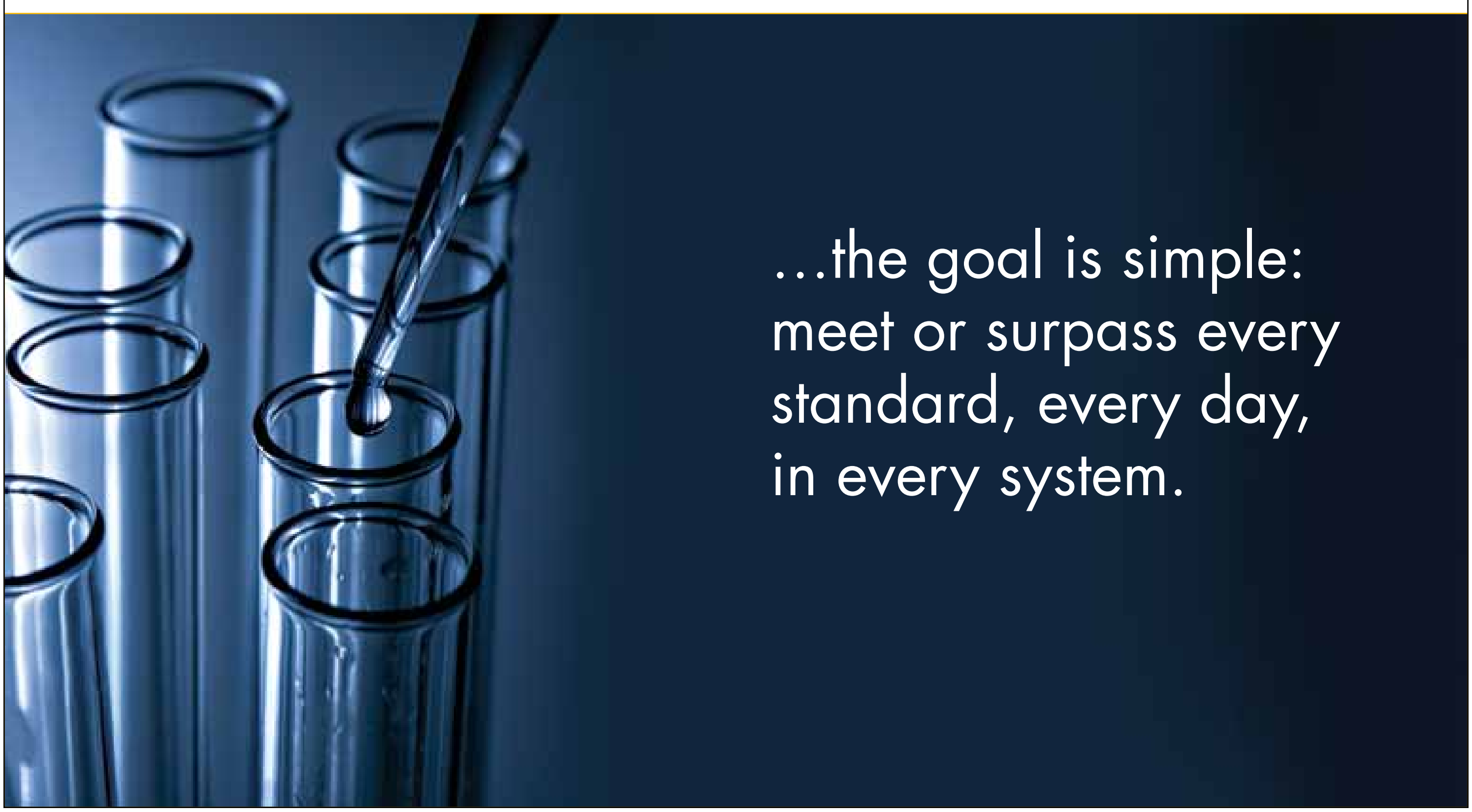
Protecting customer health and safety is Cal Water's highest priority, and we are vigilant in our efforts to ensure that our water meets or surpasses state and federal water quality standards. But how are these standards set?

The Safe Drinking Water Act, passed by Congress in 1974, authorizes the United States Environmental Protection Agency (USEPA) to set national standards for drinking water quality based on sound science that weighs potential health risks, available technology, and costs. The USEPA then reviews every regulated constituent every six years to determine whether the standard should be updated. The USEPA also evaluates emerging contaminants, and we conduct extensive testing for emerging contaminants to provide the USEPA with data.

At a minimum, the California Department of Public Health (CDPH) must adopt and enforce USEPA standards. If it chooses, it can set even more stringent standards, and CDPH often does (for fluoride, chromium, MTBE, and perchlorate, for example). Similar to the USEPA, CDPH takes a methodical approach to setting standards.

First, CDPH receives a Public Health Goal for a constituent from the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA), which is the level of a contaminant at which there are no known health effects. CDPH then determines how prevalent the contaminant is, whether commercial laboratories have the technology to analyze and detect the contaminant at the goal level, and what the costs would be to monitor and treat the contaminant to meet the goal level. It eventually sets the standard as close as is technically and economically feasible to the Public Health Goal, while placing the greatest emphasis on protecting public health.

And that's just the standard-setting process. Once a standard is in place, it is up to Cal Water's team of engineers, scientists, and water professionals to ensure that your water meets that standard. From the sampling stations that enable our certified water professionals to get the most accurate test results possible, to the state-of-the-art laboratory where our scientists conduct 300,000 tests per year, the goal is simple: meet or surpass every standard, every day, in every system.



Know What's Happening with Your Water

Most of us don't think much about our water as long as we have a clean and plentiful supply when we need it. But considering how important water is to our health, safety, and well-being, it's good to know a few basics. In previous sections, we have provided information on using this limited resource wisely. Here, we offer some information on common water quality issues.

Sand or Sediment in the Water

Dirt or sand can occur naturally in groundwater or get into water lines during repairs. Cal Water flushes water lines to help remove dirt and sand from the water when necessary, but sometimes sediment makes its way into home plumbing. If you notice particles in your water — or if a faucet has not been used for a period of time and rust or residue from pipes has collected, discoloring your water — let the water run for a minute and it should return to normal. (Water savers: While the faucet runs, collect the water in a bucket for use in your garden.) After the water returns to normal, remove your faucet's aerator and rinse it to remove collected sediment.

Water Heaters

It is important to maintain your water heater as directed by the manufacturer. Not doing so can lead to wasted energy, mineral buildup, and water quality problems. If you detect an odor in your hot water that is not present in your cold water, you may need to adjust, flush, or repair your water heater. Check with the manufacturer for details.

Milky Water

Milky or bubbly water is generally caused by harmless air bubbles. If the water is allowed to sit, the air will dissipate and the water will clear.

Home Treatment Devices

According to the United States Environmental Protection Agency, home treatment devices are rarely necessary for health reasons, but if you choose to install one, be sure to follow the manufacturer's maintenance instructions. Improperly maintained units can cause water quality problems, such as bacteria growing in carbon filters that are not replaced as recommended.

Spots on Dishes

Spots are caused by minerals in hard water that remain after the water has evaporated. The spots can be reduced by a dishwasher rinse agent.

Weird Coffee

If your coffee has an oily appearance, try cleaning your coffee maker with vinegar and water as directed by the manufacturer.

Chlorine Smell

In many places, drinking water is treated to prevent the spread of germs that can cause serious illness. Sometimes, this disinfection may give your water a chlorine taste or smell. If it does, try refrigerating your water before drinking it.

When to Contact Cal Water

Of course, we are here to help. Your Customer Center can be reached at the phone number on the back of this brochure or through the "Contact us" link at www.calwater.com.

Be sure to contact your Customer Center if:

- Your water has color or sediment that does not go away after you let your faucets run, or bubbles or a milky appearance that doesn't dissipate when the water sits.
- You detect an odor in both your hot and cold water.
- You have a water emergency or notice a water emergency — such as a broken fire hydrant — in your neighborhood.

Protecting the Water Supply

One of our most important responsibilities is protecting our water sources from pollution and contamination, and you can help.

If you have a garden, be aware that fertilizer and other chemicals can get into the groundwater if used excessively. Even organic products contain substances that can cause water quality problems. Work with a gardener or nursery to make sure that you are using appropriate amounts of anything that could impact the environment.

If you take medication, you can also help protect our water supply by responsibly disposing of drugs that are expired or no longer needed. Do not flush them down the toilet or put them in the sink. Instead, contact a pharmacy, your doctor, or the drug's manufacturer for safe disposal instructions. Or, check to see if your city or county participates in National Drug Take-Back Day.

Read All About It: Two Current Quality Issues

Two constituents have been in the news lately: perchlorate and chromium-6 (hexavalent chromium).

Cal Water tests its water for both of these constituents. Although the USEPA has not yet established a standard for perchlorate, the California Department of Public Health (CDPH) has. Cal Water must meet or surpass the state maximum contaminant level (MCL) for perchlorate, which is 6 parts per billion (ppb).

Although there is no state standard for chromium-6, there is a state standard for total chromium (chromium-6 + chromium-3). Because chromium-6 is a subset of total chromium, chromium-6 levels could not possibly exceed total chromium levels. Cal Water meets or surpasses the current MCL for total chromium, which is 50 parts per billion (ppb).

We will monitor the USEPA's standard-setting process as we continue to comply with CDPH standards. We support these public health agencies as they take a methodical, scientific approach to determine whether more stringent standards are warranted, and we will take whatever steps are deemed necessary to protect customer health and safety.

Where Chromium-6 Comes From

Chromium-6 occurs naturally at low levels in many ground and surface waters. It is also used to produce stainless steel and textile dyes, preserve wood, and tan leather, among other things. Chromium-6 can cause cancer in humans when inhaled; it is possible that if consumed, saliva and stomach acid might reduce chromium-6 to its unharmful form (chromium-3) in some cases. Public health agencies are studying several scientific issues to determine what the limit for chromium-6 in drinking water should be.

More About Perchlorate

Perchlorate can occur both naturally and through manufacturing, but large concentrations of it are more often associated with fertilizer, military installations, or the manufacturing of rockets, fireworks, flares, automobile air bags, and other things that use solid propellants. It is used medically to treat some thyroid disorders, but it can cause health problems by interfering with iodine uptake into the thyroid gland. Because perchlorate is highly water-soluble, it has the potential to be a groundwater contaminant. California established a drinking water maximum contaminant level of 6 ppb for perchlorate in 2007, which is still one of the strictest perchlorate standards in the country.

Drinking Water Source Assessment and Protection Program (DWSAPP)

By the end of 2002, Cal Water had submitted to the California Department of Public Health a DWSAPP report for each water source in the water system. The DWSAPP report identifies possible sources of contamination to aid in prioritizing cleanup and pollution prevention efforts. All reports are available for viewing or copying at our Customer Center.

The surface water source in your system is considered most vulnerable to the following activities for which no associated contaminant has been detected: gas stations, dry cleaners, and underground storage tanks (confirmed leaking tanks). The San Francisco Public Utilities Commission (SFPUC), which supplies a significant portion of the water for your district, completed such a report in 2000. It found that its watersheds are vulnerable to contaminants associated with wildlife and, to a limited extent, human recreational activity. Historically, the levels of contaminants have been very low in watersheds.

A complete copy of the report may be obtained at the SFPUC web site (www.ci.sf.ca.us/html/wqb.htm) and at the main branch of the San Francisco Public Library.

We encourage customers to join us in our efforts to prevent water pollution and protect our most precious natural resource.

What About Fluoride?

In the United States, water fluoridation has been widely practiced since 1960, and more than 65% of the largest cities in the United States currently have fluoridated drinking water. Fluoride is believed by medical and dental professionals to be a safe, effective way to prevent tooth decay, and water fluoridation is strongly supported by local, state, and national health agencies, including the

Understand Where Contaminants Come From

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the United States Environmental Protection Agency (USEPA) Safe Drinking Water Hotline at (800) 426-4791.

The sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the USEPA and the California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people, such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, some elderly people, and infants, can be particularly at risk from infections. These people should seek advice from their health care providers about drinking water. USEPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

American Medical Association, American Dental Association, California Department of Public Health, and Centers for Disease Control and Prevention.

However, since 1960, there has been a significant change in the amount of fluoride that the average American ingests from other sources (such as toothpaste). For this reason, the Department of Health and Human Services (HHS) is considering lowering the recommended level of fluoride in fluoridated water to 0.7 parts per million (ppm) from its current range of 0.7 to 1.2 ppm. The U.S. Environmental Protection Agency (USEPA) has also announced that it is considering reducing the maximum contaminant level (MCL) for fluoride, which is currently 4.0 ppm. The state of California's MCL for fluoride is 2.0 ppm.

Some water has naturally occurring fluoride, and Cal Water is required by law to add fluoride if fluoride is below optimal levels and funding from federal grants or other sources becomes available. This means that fluoride levels vary among Cal Water's many systems. In some places, natural fluoride exists at levels above the MCL and must be removed. In others, Cal Water delivers a mix of fluoridated and non-fluoridated water, resulting in water that contains fluoride at less than optimal levels for dental health. And in some places, Cal Water provides water that is fluoridated to the level recommended by medical and dental professionals to prevent tooth decay.

Fluoride In Your Area

We blend water from our surface-water treatment plant that contains natural fluoride with fluoridated water purchased from SFPUC.

More information about fluoridation, oral health, and current issues can be found on the CDPH web site at www.cdph.ca.gov/certlic/drinkingwater/Pages/Fluoridation.aspx. For general information on water fluoridation, visit us online at www.calwater.com.

Put the Standards Into Perspective

Water quality standards become increasingly stringent as technology advances, enabling us to detect increasingly minute quantities of substances in water. Most substances are limited on a "parts per million" or "parts per billion" basis. To put that into perspective…

One part per million is:

- One inch in a journey of almost 16 miles.
- A 2.5-inch square on a football field.
- One half of one word in *War and Peace.*

One part per billion is:

- One inch in six round trips from Los Angeles to New York.
- Three seconds out of 100 years.
- Three tenths of one inch of the Great Wall of China.

Water Hardness

Water's "hardness" is a measure of the amount of minerals (generally calcium and magnesium) it contains. Water is considered soft if its hardness is less than 75 parts per million (ppm), moderately hard at 75 to 150 ppm, hard at 150 to 300 ppm, and very hard at 300 ppm or higher.

Hard water is generally not a health concern, but it can have an impact on how well soap lathers and is significant for some industrial and manufacturing processes. Hard water may also lead to mineral buildup in pipes or water heaters.

Some people with hard water opt to buy a water softener for aesthetic reasons. However, some water softeners add salt to the water, and this can cause problems at wastewater treatment plants. People on low-sodium diets should be aware that some water softeners increase the sodium content of the water.

Water Main Flushing

"Flushing" is a procedure in which certain fire hydrants are opened under controlled conditions to remove minerals and sediment that build up in water lines over time or enter during water line repairs. Fire hydrants are also sometimes opened in order to ensure that they are operating properly. Because of our focus on water conservation, Cal Water only conducts flushing when necessary to ensure good water quality or when local fire agencies require fire protection data.

Although it may seem wasteful to the casual observer, flushing is an important — and necessary — water utility activity. It is endorsed by the American Water Works Association and conducted in accordance with guidelines set by the California Department of Public Health.

If flushing is being conducted in your service area, your service should not be interrupted, but you could notice a temporary dip in water pressure. If you notice any discoloration or sediment in your water after we have flushed, please allow water to run from your outside hose bib until it clears.

Know the Lingo: Key Definitions

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the United States Environmental Protection Agency (USEPA).

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs protect public health and are set as close to the PHGs (or MCLGs) as are economically and technologically feasible. Secondary MCLs relate to the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Notification Level (NL): A health-based advisory level for an unregulated contaminant in drinking water. It is used by the California Department of Public Health to provide guidance to drinking water systems.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health, along with their monitoring, reporting, and water treatment requirements.

Regulatory Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other required action by the water provider.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Lead in Water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water comes primarily from materials and components associated with service lines and home plumbing.

The water delivered by Cal Water to your meter meets all water quality standards, but your home plumbing can affect water quality. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

Primary Drinking Water Standards						Cal Water South San Francisco		SFPUC Supply		
Radiological	Year Tested	Unit	MCL (SMCL)	PHG (MCLG)	Exceeded Standard?	Range	Average	Range	Average	Source of Substance
Gross alpha particle activity	2007–2008	pCi/L	15	(0)	No	ND–11	2.35			Erosion of natural deposits
Radium 228	2008	pCi/L	5	0.019 (0)	No	ND–1.44	0.61			Erosion of natural deposits
Inorganic Chemicals	Year Tested	Unit	MCL (SMCL)	PHG (MCLG)	Exceeded Standard?	Range	Average	Range	Average	Source of Substance
Arsenic	2009	ppb	10	0.004	No	ND–9.3	3.1			Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Total Chromium	2009	ppb	50	100	No	ND–18	6			Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride	2009	ppm	2	1	No	ND–0.14	0.08	ND–0.7	0.3	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as nitrate)	2010	ppm	45	45	No	ND–6	2.7			Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Selenium	2009	ppb	50	(50)	No	5–9.6	6.83			Discharge from petroleum, glass, and metal refineries; erosion of natural deposits; discharge from mines and chemical manufacturers; runoff from livestock lots (feed additive)
	Year Tested	Unit	MCL (SMCL)	PHG (MCLG)	Exceeded Standard?	Highest Level	Lowest Monthly Percent	Highest Level	Lowest Monthly Percent	Source of Substance
Turbidity (surface water not requiring filtration)[1]	2010	NTU	5	n/a	No	n/a		4.9	100	Soil runoff
Turbidity (surface water requiring filtration)[2]	2010	NTU	TT	n/a	No	n/a		0.54	97.6	Soil runoff
Disinfection Byproducts	Year Tested	Unit	MCL (SMCL)	PHG (MCLG)	Exceeded Standard?	Range	Highest Annual Average	Range	Highest Annual Average	Source of Substance
Total haloacetic acids	2010	ppb	60	n/a	No	5.9–87.2	25.36	5.9–87.2	25.36	Byproduct of drinking water chlorination
Total trihalomethanes	2010	ppb	80	n/a	No	10.9–42.2	30.65	10.9–42.2	30.65	Byproduct of drinking water chlorination
Disinfectant and DBP Precursor	Year Tested	Unit	MRDL	MRDLG	Exceeded Standard?	Range	Average	Range	Average	Source of Substance
Chloramine	2010	ppm	4	4	No	0.3–2.77	2.0	0.3–2.77	2.0	Drinking water disinfectant added for treatment

Other Regulated Substances

Metals	Year Tested	Unit	AL	PHG (MCLG)	Exceeded Standard?	90th Percentile	Samples > AL	90th Percentile	Samples > AL	Source of Substance
Copper	2010	ppm	1.3	0.3	No	0.06	0 of 30	0.06	0 of 30	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Secondary Drinking Water Standards and Unregulated Compounds

Inorganic Chemicals	Year Tested	Unit	SMCL	PHG (MCLG)	Exceeded Standard?	Range	Average	Range	Average	Source of Substance
Calcium	2009	ppm	n/a	n/a	No	56–76	64	2–26	12	Erosion of natural deposits
Chloride	2009	ppm	500	n/a	No	110–140	123.33	3–16	9.5	Erosion of natural deposits; seawater influence
Chromium-6	2010	ppb	n/a	n/a	No	ND–16	4.34			Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Color	2009–2010	Units	15	n/a	No	ND–1	0.6	<5–6	<5	Naturally occurring organic matter
Hardness	2009	ppm	n/a	n/a	No	380–400	390	8–104	53	Erosion of natural deposits
Magnesium	2009	ppm	n/a	n/a	No	48–64	56.33	0.3–9	4.6	Erosion of natural deposits
Manganese	2010	ppb	50	n/a	No	ND–2.5	0.52			Leaching from natural deposits
Odor	2009	Units	3	n/a	No	ND–1	0.33			Naturally occurring organic matter
pH	2010	Units	n/a	n/a	No	6.91–7.8	7.24	8.2–8.7	8.5	Inherent characteristic of water
Sodium	2009	ppm	n/a	n/a	No	72–86	77	3–22	13	Erosion of natural deposits; seawater influence
Specific conductance	2009	μS/cm	1600	n/a	No	1000–1100	1066.67	33–316	179	Erosion of natural deposits; seawater influence
Sulfate	2009	ppm	500	n/a	No	85–150	107.67	1.6–38.7	18.2	Runoff/leaching from natural deposits; industrial wastes
Total dissolved solids	2009	ppm	1000	n/a	No	600–690	643.33	27–174	95	Runoff/leaching from natural deposits
Turbidity (groundwater)	2009	NTU	5	n/a	No	ND–0.34	0.08			Soil runoff

1 The turbidity standard for unfiltered supplies is 5 NTU. Turbidity is a measure of the cloudiness of water. We monitor it because it is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants.

2 For surface water systems, the treatment technique dictates that the turbidity level of the filtered water be less than or equal to 0.3 NTU in 95% of the measurements taken each month and shall not exceed 1 NTU at any time. Turbidity is a measurement of the cloudiness of water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

How to Read This Table

Cal Water tests your water for more than 140 regulated contaminants and dozens of unregulated contaminants. A list of regulated contaminants can be found in the Water Quality section of calwater.com. The table in this report lists only those contaminants that were detected.

In the table, water quality test results are divided into two main sections: "Primary Drinking Water Standards" and "Secondary Drinking Water Standards and Unregulated Compounds." Primary standards protect public health by limiting the levels of certain constituents in drinking water. Secondary standards are set for substances that could affect the water's taste, odor, or appearance. Selected unregulated substances (hardness and sodium, for example) are listed for your information.

μS/cm = measure of specific conductance

n/a = not applicable

ND = not detected

NTU = nephelometric turbidity unit

pCi/L = picoCuries per liter (measure of radioactivity)

ppb = parts per billion (micrograms per liter)

ppm = parts per million (milligrams per liter)

ppt = parts per trillion (nanograms per liter)

SMCL = secondary maximum contaminant level

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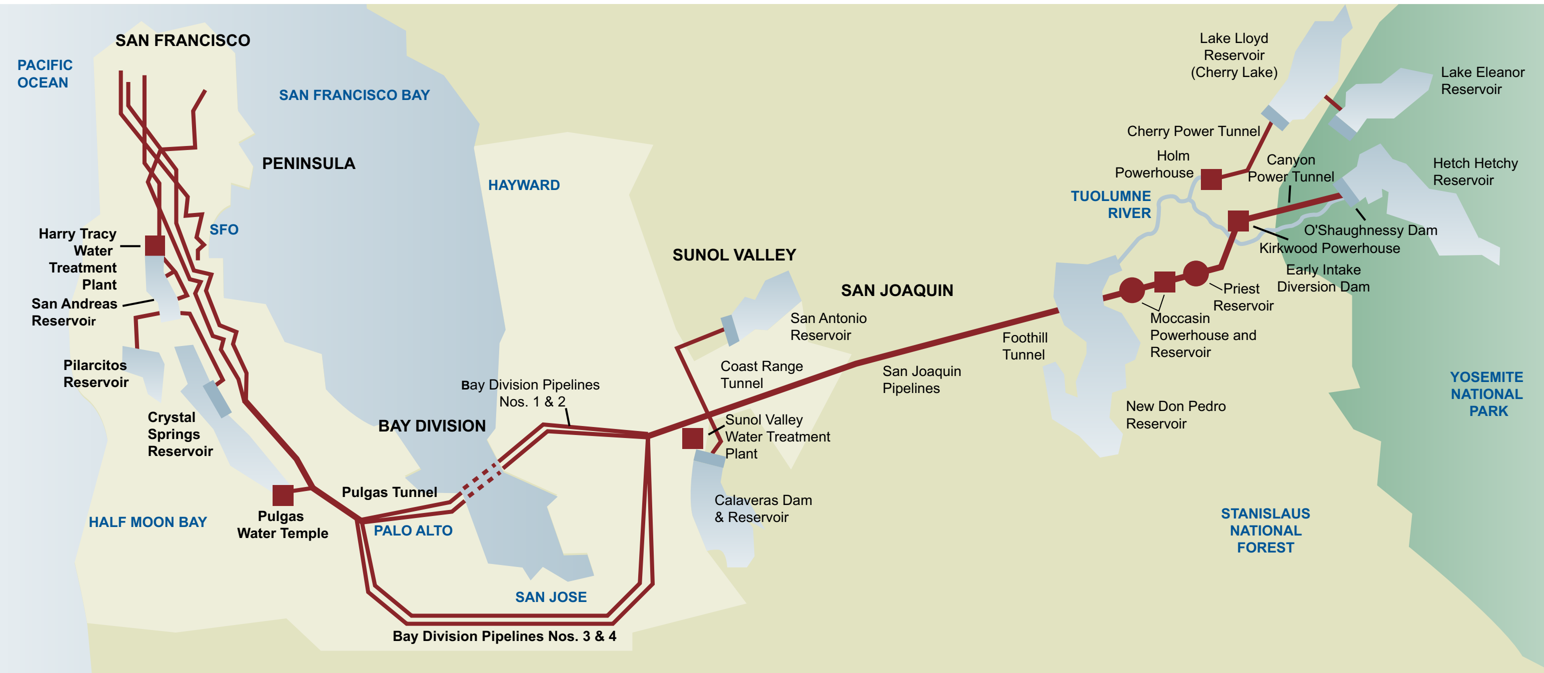
Your water quality results for 2010

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Hetch Hetchy Regional Water System

Operated by San Francisco Water, Power and Sewer



Our Drinking Water Sources

We safeguard the pristine quality of our local watersheds.

Protecting Our Watersheds

We actively protect the natural water resources entrusted to our care. Our annual Hetch Hetchy Watershed survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities with partner agencies (such as the National Park Service and US Forest Service). We also conduct sanitary surveys every five years to detect and track sanitary concerns for the Bay Area watersheds and the approved standby water sources in Early Intake Watershed, which includes Cherry Lake and Lake Eleanor. The surveys identified wildlife, stock, and human activities as potential contamination sources. They are available for review at the CDPH San Francisco District office, 510-620-3474.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells. For our system, the major water source originates from spring snowmelt flowing down the Tuolumne River to the Hetch Hetchy Reservoir, where it is stored. This pristine Sierra water source meets all federal and state criteria for watershed protection. We also maintain stringent disinfection treatment practices, extensive bacteriological-quality monitoring, and high operational standards. As a result, the CDPH and USEPA have granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that we are not required to filter water from the Hetch Hetchy Reservoir.

The Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff from the Alameda Watershed - within the greater 128,424-acre Southern Alameda Creek Watershed and spanning more than 35,000 acres in Alameda and Santa Clara counties - are collected in the Calaveras and San Antonio reservoirs and treated at the Sunol Valley Water Treatment Plant.

Rainfall and runoff from the 23,000-acre Peninsula Watershed in San Mateo County are stored in Crystal Springs, San Andreas, and Pilarcitos reservoirs and treated at the Harry Tracy Water Treatment Plant.

In 2010, the Hetch Hetchy Watershed provided the majority of our total water supply, with the remainder contributed by the two local watersheds.

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است.اگر نمیتوانیداین اطلاعات را بزبان انگلیسی بخوانید لطفاازکسی که میتواندیاری بگیرید تامطالب رابرای شمابه فارسی ترجمه کند.

Cé rapport contient des information importantes concernant votre eau potable. Veuillez traduire, ou parlez avec quelqu' un qui peut le comprendre.

”هذا ألتقرير يحتوي على معلومآ ت مهمّة تتعلق بمياه ألشفة (أو ألشرب). ترجم ألتقرير, أو تكلم مع شخص يستطيع أن يفهم ألتقرير.“

Данный рапорт содержит важную информацию о вашей питьевой воде. Переведите его или проконсультируйтесь с тем, кто его понимает.

הדו"ח הזה מכיל מידע חשוב לגבי מי השתייה שלך תרגם את הדו"ח או דבר עם מישהו שמבין אותו

此份水質報告, 內有重要資訊。請找他人為你翻譯和解說清楚。

Chi tiết này thật quan trọng. Xin nhờ người dịch cho quý vị.

Dieser Bericht enthält wichtige Informationen über Ihr Trinkwasser. Bitte, übersetzen Sie sie, oder sprechen Sie mit jemandem, der sie versteht.

Questo rapporto contiene informazioni inportanti che riguardano la vostra aqua potabile. Traducetelo, o parlate con una persona qualificata in grado di spiegarvelo.

この情報は重要です。翻訳を依頼してください。

เอกสารฉบับนี้มีข้อมูลสำคัญเกี่ยวกับน้ำดื่ม ควรแปลข้อความหรือถามบุคคลที่มีความรู้ในเรื่องนี้

यह सूचना महत्वपूर्ण है । कृपा करके किसी से :सका अनुवाद करायें ।

이 안내는 매우 중요합니다. 본인을 위해 번역인을 사용하십시요.

Η κατοθεν αναφορα παρουσιαζη σπουδαιες πληροφορειες για το ποσιμο νερο σας. Πρακακλω να το μεταφρασετε η να το σξολειασετε με καποιον που το καταλαβαινη απολητως.

San Francisco Water Power Sewer

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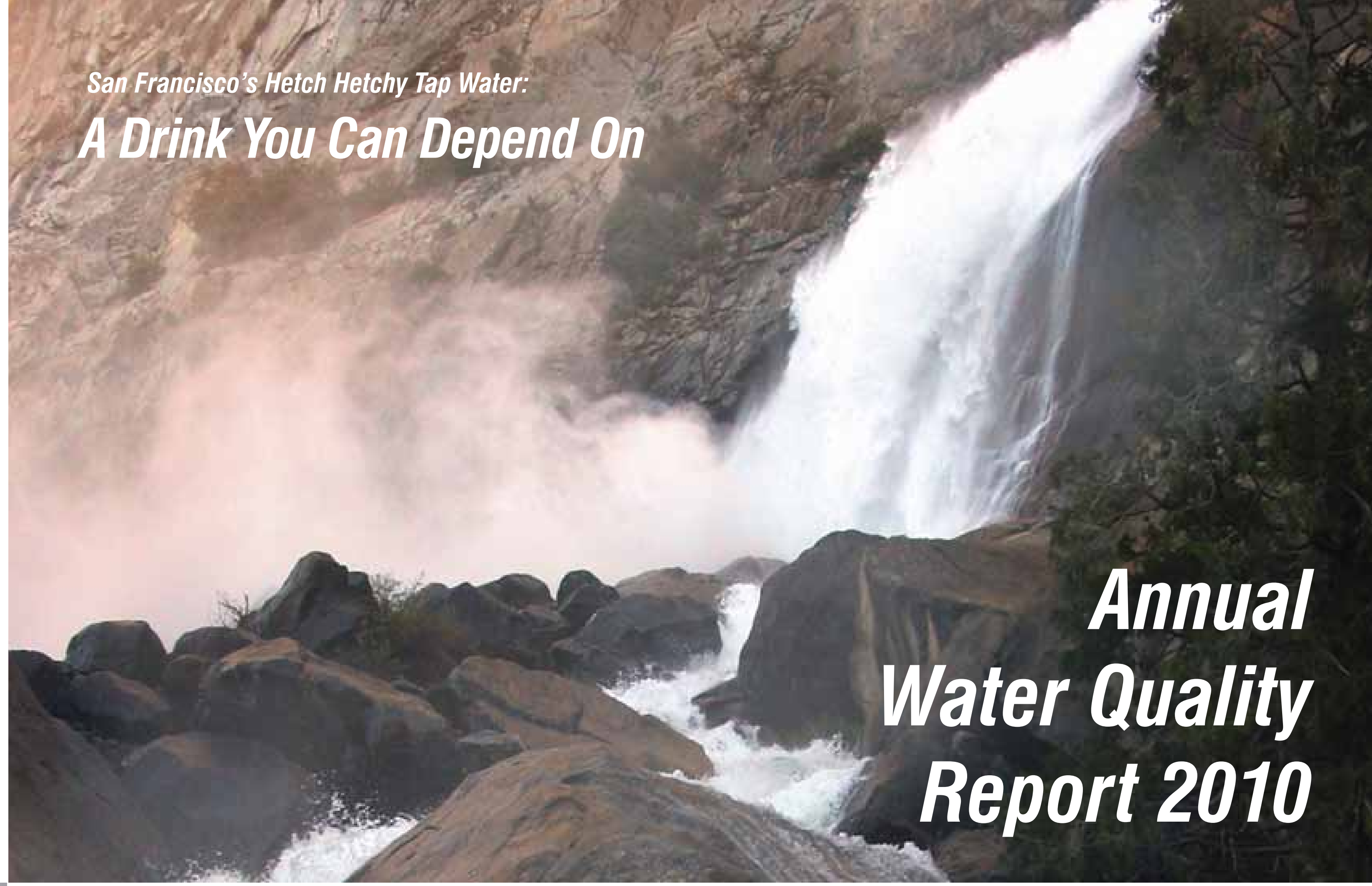


San Francisco's Hetch Hetchy Tap Water:

A Drink You Can Depend On

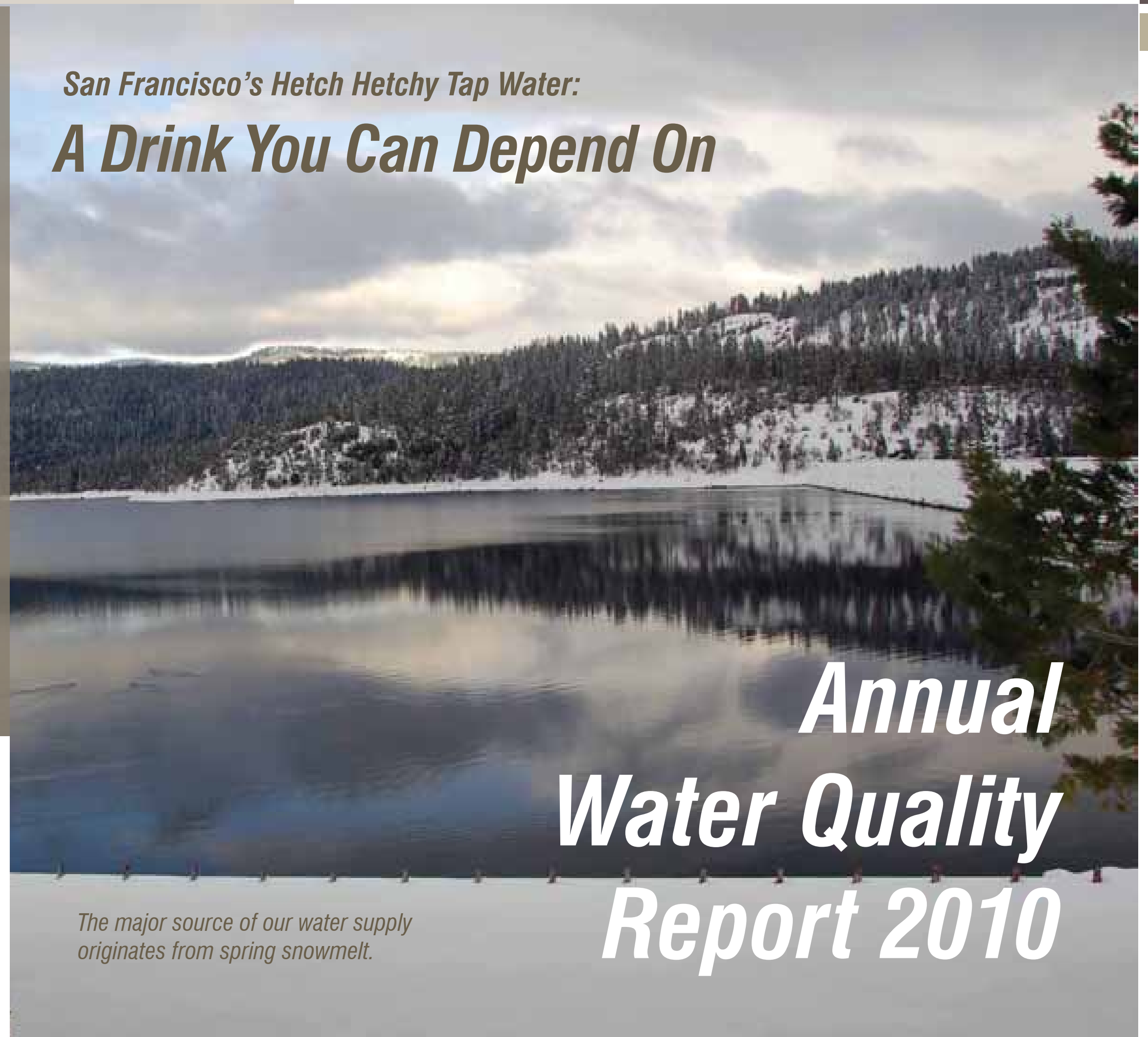
Annual Water Quality Report 2010

In this issue:

This state-mandated annual report contains important information on the quality of your drinking water.

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission



San Francisco's Hetch Hetchy Tap Water:

A Drink You Can Depend On

The major source of our water supply originates from spring snowmelt.

Annual Water Quality Report 2010

San Francisco Public Utilities Commission

Water quality policies are decided at Commission hearings, held the second and fourth Tuesdays of each month at 1:30 pm at San Francisco City Hall, Room 400. For more information visit **www.sfwater.org**.

For more information about the contents of this report, contact **Michele Liapes, 415-554-3211, mliapes@sfwater.org**, or visit us online at **www.sfwater.org/quality**.

Call **311** to report water, power or sewer issues.

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

Dear Customer

We are proud to bring you some of the highest-quality drinking water in the country—pristine Sierra snowmelt from the Hetch Hetchy Reservoir plus waters from protected local watersheds.

In 2010, as in years past, our water met or exceeded federal and state standards for drinking water. This annual Water Quality Report, which the State of California mandates that we send to every customer, contains important information about your drinking water.

This summer we made our great Hetch Hetchy tap water even better by completing California's largest ultraviolet disinfection facility. This project is part of our ongoing $4.6 billion seismic and reliability upgrade to the Hetch Hetchy Regional Water System that supplies water to 2.5 million people in the Bay Area. I'm proud to report that this program, launched in 2005, is currently under budget and on schedule to meet our 2015 completion date.

All our work ensures that you, our customers, can count on pristine Hetch Hetchy water to start the day, award-winning sewer service to protect the bay, and clean, renewable power to keep the city lights running.

We look forward to reliably serving you in the years to come. Thank you for your continued support.

Ed Harrington

General Manager

Want to learn more about drinking water regulations?
Visit the CDPH website **www.cdph.ca.gov** or the USEPA website **www.epa.gov**.

Water Quality:

Contaminants and Regulations

Our Water Quality Division regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure that the water delivered to you meets or exceeds federal and state drinking water standards. In 2010, Water Quality staff conducted more than 108,080 drinking water tests in the transmission and distribution systems. This monitoring effort is in addition to the extensive treatment process control monitoring performed by our certified and knowledgeable treatment plant staff and online instruments.

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (USEPA) and California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline **800-426-4791**.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

At the Millbrae Water Quality Laboratory research chemist David Nehrkorn tests for minute amounts of organic compounds in a water sample.

Special Health Needs

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline **800-426-4791** or at **www.epa.gov/safewater.**

City of San Francisco Water Quality Data for Year 2010

The table below lists all 2010 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits are not shown, in accord with CDPH guidance. The CDPH allows us to monitor for some contaminants less than once per year because their concentrations do not change frequently. We also received from the CDPH a monitoring waiver for some contaminants that were absent in the water.

DETECTED CONTAMINANTS	UNIT	MCL	PHG OR (MCLG)	RANGE OR LEVEL FOUND	AVERAGE OR [MAX]	MAJOR SOURCES IN DRINKING WATER
TURBIDITY						
For Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.6 (1)	[4.9] (2)	Soil runoff
For Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 (3)	N/A	-	[0.54]	Soil runoff
	-	min 95% of samples ≤0.3 NTU (3)	N/A	98% - 100%	-	Soil runoff
For Filtered Water from Harry Tracy Water Treatment Plant (HTWTP)	NTU	1 (3)	N/A	-	[0.19]	Soil runoff
	-	min 95% of samples ≤0.3 NTU (3)	N/A	100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	23 - 52	[39] (4)	Byproduct of drinking water chlorination
Haloacetic Acids	ppb	60	N/A	15 - 39	[28] (4)	Byproduct of drinking water chlorination
Total Organic Carbon (5)	ppm	TT	N/A	2.4 - 3.2	2.7	Various natural and man-made sources
MICROBIOLOGICAL						
Total Coliform	-	NoP ≤5.0% of monthly samples	(0)	-	[0]	Naturally present in the environment
Giardia lamblia	cyst/L	TT	(0)	ND - 0.06	[0.06]	Naturally present in the environment
INORGANIC CHEMICALS						
Fluoride (source water) (6)	ppm	2.0	1	ND - 0.9	0.3 (7)	Erosion of natural deposits
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.12 - 3.1	[1.9] (4)	Drinking water disinfectant added for treatment
CONSTITUENTS WITH SECONDARY STANDARDS	**UNIT**	**SMCL**	**PHG**	**RANGE**	**AVERAGE**	**TYPICAL SOURCES OF CONTAMINANT**
Chloride	ppm	500	N/A	3 - 16	9.5	Runoff / leaching from natural deposits
Color	unit	15	N/A	<5 - 6	<5	Naturally occurring organic materials
Specific Conductance	µS/cm	1600	N/A	33 - 316	179	Substances that form ions when in water
Sulfate	ppm	500	N/A	1.6 - 38.7	18.2	Runoff / leaching from natural deposits
Total Dissolved Solids	ppm	1000	N/A	27 - 174	95	Runoff / leaching from natural deposits
Turbidity	NTU	5	N/A	0.07 - 0.33	0.16	Soil runoff
LEAD AND COPPER (8)	**UNIT**	**AL**	**PHG**	**RANGE**	**90TH PERCENTILE**	**MAJOR SOURCES IN DRINKING WATER**
Copper	ppb	1300	300	12 - 152	66	Corrosion of household plumbing systems
Lead	ppb	15	0.2	<1 - 16.6	6.9	Corrosion of household plumbing systems

OTHER WATER QUALITY PARAMETERS	UNIT	ORL	RANGE	AVERAGE
Alkalinity (as $CaCO_3$)	ppm	N/A	8 - 98	49
Bromide	ppb	N/A	<10 - 17	<10
Calcium (as Ca)	ppm	N/A	2 - 26	12
Chlorate (9)	ppb	(800) NL	92 - 357	150
Hardness (as $CaCO_3$)	ppm	N/A	8 - 104	53
Magnesium	ppm	N/A	0.3 - 9	4.6
pH	-	N/A	8.2 - 8.7	8.5
Potassium	ppm	N/A	0.34 - 1.2	0.6
Silica	ppm	N/A	4.1 - 7.6	5.7
Sodium	ppm	N/A	3 - 22	13

KEY:

- < / ≤ = less than / less than or equal to
- **AL** = Action Level
- **Max** = Maximum
- **Min** = Minimum
- **N/A** = Not Available
- **ND** = Non-detect
- **NL** = Notification Level
- **NoP** = Number of Coliform-Positive Sample
- **NTU** = Nephelometric Turbidity Unit
- **ORL** = Other Regulatory Level
- **ppb** = part per billion
- **ppm** = part per million
- **µS/cm** = microSiemens / centimeter

NOTES: (1) Turbidity is measured every four hours. These are monthly average turbidity values. **(2)** This is the highest turbidity of the unfiltered water served to customers in 2010. The switch of San Joaquin Pipelines and rate change caused elevated turbidities as a result of sediment resuspension in the pipelines. The turbidity spike was not observed further downstream at Alameda East. **(3)** There is no MCL for turbidity. The limits are based on the TT requirements in the State drinking water regulations. **(4)** This is the highest quarterly running annual average value. **(5)** Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only. **(6)** We add fluoride to the naturally occurring level to help prevent dental caries in consumers. The CDPH requires our fluoride levels in the treated water to be maintained within a range of 0.8 ppm - 1.5 ppm. In 2010, the range and average of our fluoride levels were 0.6 ppm - 1.5 ppm and 1.0 ppm, respectively. **(7)** The naturally occurring fluoride levels in the Hetch Hetchy and SVWTP raw water were ND and 0.15 ppm, respectively. The HTWTP raw water had elevated fluoride levels of 0.7 ppm - 0.9 ppm due to the continued supply of the fluoridated Hetch Hetchy & SVWTP treated water into the Lower Crystal Springs Reservoir, which supplies water via the San Andreas Reservoir to the HTWTP for treatment. **(8)** The most recent Lead and Copper Rule monitoring was in August 2009. One of the 59 water samples collected at consumer taps had lead concentration above the Action Level. **(9)** There was no chlorate detected in the raw water sources except the Crystal Springs and San Andreas reservoirs, where the detected chlorate was 81 ppb and 57 ppb, respectively. The chlorate levels in both reservoirs are due to the transfer of the disinfected Hetch Hetchy water and SVWTP effluent into the Crystal Springs Reservoir. The detected chlorate in treated water is a degradation byproduct of sodium hypochlorite, the primary disinfectant we use for water disinfection.

Note: The blend of different water sources has been variable and has resulted in varying water quality due to system improvements and operational constraints. Additional water quality data may be obtained by calling the Water Quality Division toll free number at **877-737-8297**.

Key Water Quality Terms

Following are definitions of key terms noted on the adjacent water quality data table. These terms refer to the standards and goals for water quality described below.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A water clarity indicator that is also used to indicate the effectiveness of the filtration plants. High turbidity can hinder the effectiveness of disinfectants.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Cryptosporidium is a parasitic microbe found in most surface water. We regularly test for this waterborne pathogen, and found it at very low levels in source water and treated water in 2010. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of *Cryptosporidium* may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. *Cryptosporidium* must be ingested to cause disease, and it may be spread through means other than drinking water.

Reducing Lead from Plumbing Fixtures

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but cannot control the variety of materials used in your household or building plumbing components. There are no known lead service lines in the San Francisco water distribution system. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline **800-426-4791**, or at **www.epa.gov/safewater/lead**.

In addition to efforts to protect water sources from lead contamination, we have taken the following actions to minimize customer exposure to lead in water by:

- Replacing brass meters with lead-free meters.
- Partnering with the San Francisco Department of Public Health to offer free lead tests for children enrolled in the Women, Infants and Children (WIC) program. Eligible clients should call the WIC program and request a voucher for a free lead test of their tap water.
- Offering customers low-cost water testing for lead ($25 per tap). Call **877-737-8297**.
- Offering lead-free kitchen faucets to San Francisco customers at a discounted price of $10 each ($110 wholesale value). For more information, please visit **http://faucet.sfwater.org.**

San Francisco Drinking Water on Tap at New Water-Bottle Refill Stations

Fifteen new and innovative water-bottle refill stations are now available in public places throughout San Francisco, from the Marina Green to Golden Gate Park and the airport. The sleek blue installations shoot water straight down into an empty container, giving runners, cyclists, pedestrians and other residents or visitors free access to San Francisco's high-quality tap water.

The stations enable people to reuse their own containers rather than buying bottled water and discarding the empty plastic containers into the landfill, where they leak toxic additives into the soil. The manufacture and shipping of bottled water products also release pollutants into the atmosphere.

APPENDIX C – MONITORING PROTOCOLS

South Westside Basin
Groundwater Monitoring Plan

Draft

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

This Monitoring Plan is developed as part of the South Westside Basin Groundwater Management Plan (GWMP). Monitoring is currently performed by individual agencies either to meet regulatory requirements or on a voluntary basis. The Monitoring Plan is intended to meet local needs as well as to support compliance with the guidelines of the California Groundwater Elevation Monitoring Program authorized by SBx7 6.

It is important that monitoring protocols and frequencies be adhered to over the long-term. As such, the protocols and frequencies are defined to be realistic for agencies that have limited funds and personnel for monitoring activities. Should an agency feel that the monitoring is an undue burden, they should request revision to the requirements in the Plan so that the most critical monitoring can be identified for continuation, while less critical monitoring can be ceased or curtailed.

This Monitoring Plan is intended to meet the current and future needs for:

- Compliance with the Groundwater Management Plan (GWMP) Basin Management Objectives, including:
  - Groundwater levels
  - Groundwater quality
  - Land subsidence
- Trend analysis of groundwater level and groundwater quality
- Analysis of flow direction, including
  - Detection of seawater intrusion
  - Migration of poor quality groundwater
  - Identification of sources of recharge
- Future estimates of change in storage and other groundwater budget components
- Groundwater projects that will required baseline water level and water quality data for planning and operational monitoring, including
  - Recycled water programs
  - Conjunctive use programs
- Groundwater modeling efforts, which rely heavily on historical data
- Installation of future monitoring or production wells
- Compliance with guidelines of SBx7 6

The details of this plan are based largely on two previous documents, an unadopted groundwater management plan for the Westside Basin and an unadopted draft groundwater management plan for the North Westside Basin. These documents were updated based on changes in the basin and in monitoring needs since the development of those documents.

The location and frequency of sampling requires foresight into the data needs of the future. Today's monitoring is typically of little use until or unless there is a long period of record to analyze trends and a large dataset to analyze spatial variability. Decisions to monitor for water levels and water quality today can greatly improve the ease and accuracy of future water planning efforts.

LOCATIONS

Locations are selected to meet the previously stated goals. Locations include sites selected for the following two primary categories:

- Basin Conditions: These locations are necessary to accurately represent regional basin conditions.
- Coastal Monitoring: These locations are necessary for detection of seawater intrusion at coastal and bayside locations.

WATER LEVELS

Water level will be monitored semiannually through static water level monitoring events. The events will be scheduled for April and October and require coordination and cooperation between the South Westside Basin agencies, SFPUC, and voluntarily participating private well owners.

Wells currently being monitored for water levels are owned by water agencies, the USGS, and United Airlines. Private wells may be added to the well network in the future. Efforts will be made to encourage voluntary participation by owners of private groundwater wells to fill data gaps, notably in the Colma area. Materials to develop the voluntary program are contained in Attachment 1.

A list of wells to be included in monitoring activities for groundwater levels, with well owner, is provided in Table C-1 and shown on Figure C-1. Coordination with well owners will be required to ensure full participation. Figure C-1 distinguishes between short-screened monitoring wells and other wells used for monitoring (i.e., active or inactive production wells). The short-screened monitoring wells are ideal for accurately identifying water levels and water quality in the multilayered aquifer system. Figure C-1 further shows gaps in the short-screened monitoring well network, notably in near the San Bruno wellfield and to the northwest of the CalWater wellfield. The Burlingame and Millbrae areas in general are lacking in monitoring wells. Efforts are needed to add wells such as Burlingame's Washington Park well, cemetery and golf course wells, and to install dedicated short-screened monitoring wells.

Table C-1 Wells Monitored for Water Levels

Well	Well Owner	Type	X	Y	Elevation (ft)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Total Depth (ft bgs)	Date Installed
SS 1-02	CalWater	P	6002654	2067151	38.52			275	<1923
SS 1-14	CalWater	P	6002975	2067137	41.29	69	500	547	1923
SS 1-15	CalWater	P	6002414	2067036	36.25	120	535	539	1925
SS 1-17	CalWater	P	6002288	2067486	32.36	150	460	478	1939
SS 1-18	CalWater	P	6001775	2067635	44.73	231	578	535	
SS 1-19	CalWater	P	6003216	2067282	30.81	216	528	528	1974
SS 1-20	CalWater	P	6002565	2067324	39.28	380	580	602	1973
SS 1-21	CalWater	P	6002082	2067920	44.73	370	580	620	1975
DC-1 (Westlake)	Daly City		5987458	2082018	114.42	190	370		
DC-3	Daly City	M	5988531	2081853	112.73	170	414		
DC-8	Daly City		5991977	2082370	212.92	200	479		
DC-9	Daly City		5991979	2082478	237.07				
A Street Well	Daly City	P	5992408	2078206	189.69	400	580	590	
Jefferson Well	Daly City	P	5991755	2081833	212.9	465	690	700	1991
Vale Well	Daly City	P	5991910	2080289	177.54	420	690	700	1991
Westlake 1	Daly City	P	5988107	2081360	114.42	340	680	702	1954
Westlake 2	Daly City	P	5987621	2081931	114.42	255	369	388	1955
Burlingame-S	San Bruno	M	6019826	2044206	7.42	83	93	98	2006
Burlingame-M	San Bruno	M	6019827	2044206	7.49	151	161	166	2006
Burlingame-D	San Bruno	M	6019826	2044206	7.46	265	270	280	2006
SB-12	San Bruno	P	6006011	2056914	72.85	146	482	478	1960
SB-15	San Bruno	P	6004161	2057061	82.73	300	500	534	1984
SB-16	San Bruno	P	6006684	2058648	49.24	340	550	600	1991

Well	Well Owner	Type	X	Y	Elevation (ft)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Total Depth (ft bgs)	Date Installed
SB-17	San Bruno	P	6009708	2053648	22.72	300	515	515	1993
SB-18	San Bruno	P	6006719	2051725	82.73	260	460	495	1996
SB-20	San Bruno	P	6009465	2055158	22.73	300	594	624	2002
SFO-S	San Bruno	M	6012376	2058115	10.09	136	146	74	2006
SFO-D	San Bruno	M	6012376	2058115	10.13	64	74	146	2006
13C	UAL	M	6012332	2058386		136	146		2000
13D	UAL	M	6012332	2058386		31.5	41.5		2000
Fort Funston-S	USGS	M	5983395	2088146	189.21	250	270	278	
Fort Funston-M	USGS	M	5983395	2088146	189.28	572	592	602	1989
Thornton Beach MW 225	Daly City	M	5984468	2082885	223.73	195	215		
Thornton Beach MW 360*	Daly City	M	5984468	2082885	223.73	330	350		
Thornton Beach MW 670*	Daly City	M	5984468	2082885	223.73	640	660		
LMMW-6D	SFPUC	M	5987422	2085398	37.74	230	250		1996
Park Plaza MW 460	SFPUC	M	5988908	2081724					
Park Plaza MW 620	SFPUC	M	5988908	2081724					
CUP-10A-160	SFPUC	M	5991609	2077956	197	140	160	171	2008
CUP-10A-250	SFPUC	M	5991609	2077956	196.88	230	250	261	2008
CUP-10A-500	SFPUC	M	5991608	2077957	196.84	480	500	510	2008
CUP-10A-710	SFPUC	M	5991609	2077956	196.84	640	710	720	2008
CUP-18-230	SFPUC	M	5993528	2075682	164.17	210	230	241	2008
CUP-18-425	SFPUC	M	5993528	2075682	164.12	405	425	435	2008

Well	Well Owner	Type	X	Y	Elevation (ft)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Total Depth (ft bgs)	Date Installed
CUP-18-490	SFPUC	M	5993528	2075682	164.03	469	489	500	2008
CUP-18-660	SFPUC	M	5993527	2075682	163.98	590	660	671	2008
CUP-19-180	SFPUC	M	5994566	2074129	113.95	160	180	191	2008
CUP-19-475	SFPUC	M	5994566	2074128	113.87	455	475	484	2008
CUP-19-600	SFPUC	M	5994566	2074129	113.81	580	600	611	2008
CUP-19-690	SFPUC	M	5994566	2074128	113.77	670	690	699	2008
CUP-22A-140	SFPUC	M	5996282	2070654	99.81	120	140	151	2008
CUP-22A-290	SFPUC	M	5996282	2070654	99.74	270	290	301	2008
CUP-22A-440	SFPUC	M	5996282	2070654	99.61	420	440	451	2008
CUP-22A-545	SFPUC	M	5996282	2070654	99.54	525	545	555	2008
CUP-23-230	SFPUC	M	5997796	2071165	85.13	210	230	240	
CUP-23-440	SFPUC	M	5997796	2071165	85.07	420	440	452	
CUP-23-515	SFPUC	M	5997797	2071165	85	495	515	525	
CUP-23-600	SFPUC	M	5997796	2071165	84.98	580	600	610	
CUP-36-160	SFPUC	M	6002361	2065977	70.16	140	160	170	2008
CUP-36-270	SFPUC	M	6002360	2065677	70.1	250	270	280	2008
CUP-36-455	SFPUC	M	6002360	2065677	70.06	435	455	465	2008
CUP-36-585	SFPUC	M	6002360	2065977	70	535	585	595	2008
SSFLP-MW120	SFPUC	M	6004658	2064310	41.34	110	120	120	2008
SSFLP-MW220	SFPUC	M	6004658	2064310	41.52	200	210	220	2008
SSFLP-MW440	SFPUC	M	6004659	2064310	41.03	360	430	440	2008
SSFLP-MW520	SFPUC	M	6004658	2064310	41.09	500	510	520	2008
MW-CUP-44-1-190	SFPUC	M	6003877	2059298	109.71	170	190	200	
MW-CUP-44-1-300	SFPUC	M	6003877	2059268	109.59	281	301	311	

Well	Well Owner	Type	X	Y	Elevation (ft)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Total Depth (ft bgs)	Date Installed
MW-CUP-44-1-460	SFPUC	M	6003876	2059298	109.72	440	460	470	
MW-CUP-44-1-580	SFPUC	M	6003877	2059298	109.77	525	580	590	
MW-CUP-M-1	SFPUC	M	6013110	2048785					

Notes:

Types: P = current or former production well; M = dedicated monitoring well
ft bgs = feet below ground surface
x/ y projection: California State Plane Zone 3,NAD 83, feet
elevation vertical datum: NAVD88

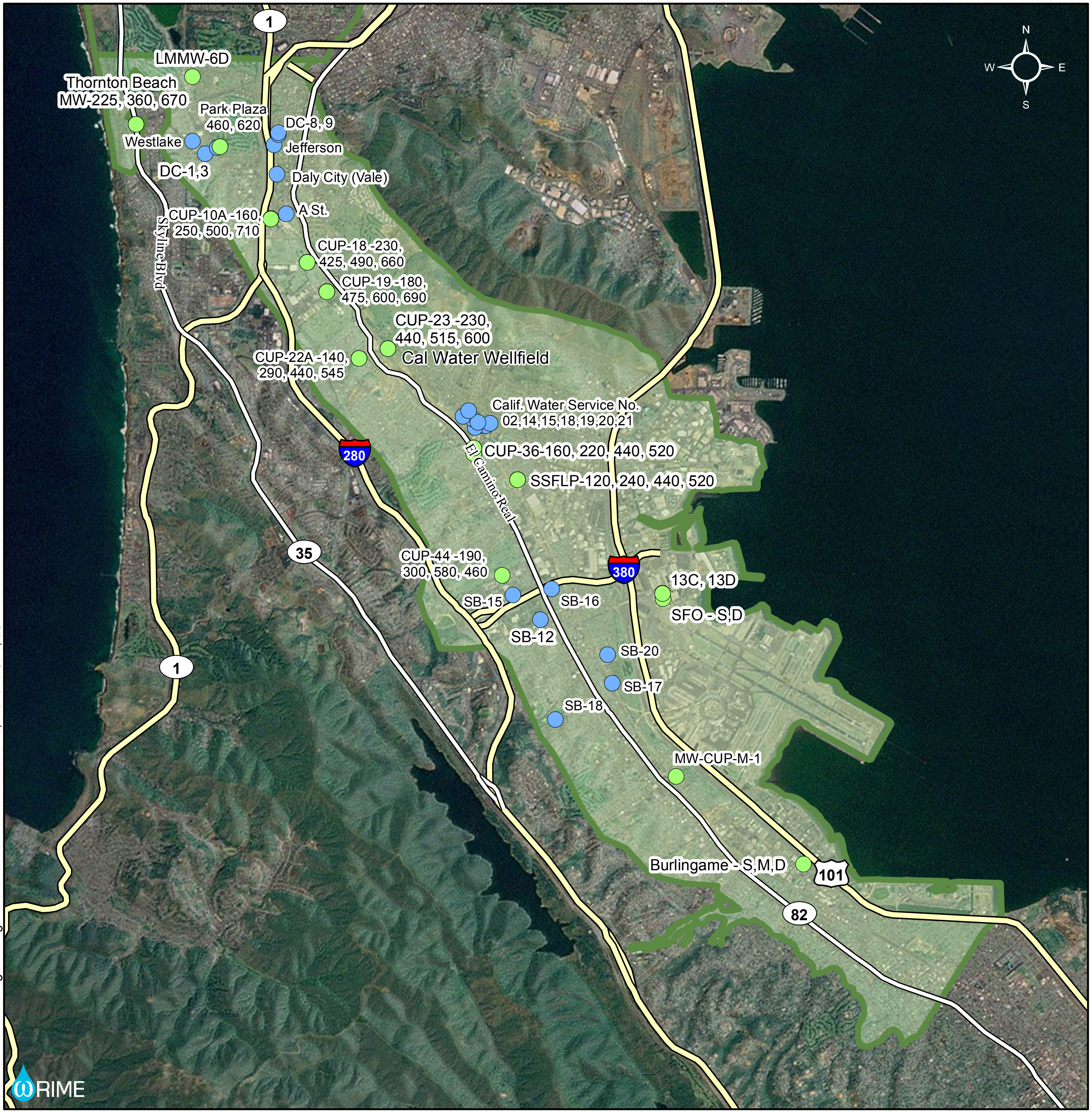


Figure C-1
Wells Monitored for Groundwater Levels

Legend

- Short Screened Wells
- Other Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\215 - San Bruno\Figures\Figure C1 on Wells GW Levels.mxd, November 4, 2011

WATER QUALITY

Water quality is sampled as needed to meet Title 22 requirements, with additional sampling focused in coastal wells to monitor for seawater intrusion. The wells to be sampled are the same as those described in the Water Level section.

Minimally, coastal monitoring wells will be sampled for chloride, TDS, and specific conductance. A more complete water quality sampling is encouraged, including the following: alkalinity, bicarbonate, bromide, chloride, conductivity, nitrate ortho-phosphate, pH, sulfate, TDS, boron, calcium, magnesium, potassium, and sodium. These additional analyses will allow for improved analysis of the presence of seawater intrusion along with analyses to support basin-wide monitoring needs.

If needed, additional sampling to support characterization of regional nitrate concentrations in the aquifer may be developed in the future.

FREQUENCY

Basin-wide, coordinated static water levels will be measured semi-annually, in April and October of each year. These dates are selected to be seasonally high groundwater levels after the rainy season (April measurement) and seasonally low groundwater levels after the dry season (October measurement).

It is desired that all available municipal wells be monitored monthly for water levels within the basin. Such monthly monitoring would be performed by water agency staff near the first of the month. Benefits of monthly measurements over semi-annual measurements is better definition of seasonal highs and lows, as well as better identification of measurement or transcription errors by comparing to the previous and following measurements. Monthly measurements are also useful for detailed analysis, including development and refinement of groundwater models. Installations of pressure transducers can provide daily data and are encouraged.

For groundwater quality, coastal wells will be sampled semiannually while other wells will be sampled to meet DPH requirements.

METHODS

Details on monitoring methods are available in the USGS National Field Manual at http://pubs.water.usgs.gov/twri9A4/ . A summary of requirements for methods are provided below for both water levels and water quality.

GROUNDWATER LEVELS

Groundwater levels are intended to represent static water level conditions. The agencies will coordinate to select the same date to perform the semiannual static groundwater level monitoring event.

Measurements will be made by trained, knowledgeable personnel. Field forms used by the monitoring technician should have information on previous measurements for context when measuring.

Static Water Level Program Key Activities

- Measure WL and flow
- Turn off wells for 24 hours
- Measure static WL
- Turn on wells

Measured wells should have basic information on file, including:

- Location, with projection information and source (surveyed, GPS, or other method)
- Elevation of reference point for measurement and ground surface, with datum information and source (surveyed or GPS)
- Depth from reference point to screen interval
- Depth from reference point to the bottom of the well
- Lithology and well construction information

The procedure for measuring groundwater levels will be as follows:

- Record pumping water level and flow rate prior to turning off pump.
- Turn off well, if applicable, for a period of at least 24 hours. The period required for recovery should be tested (and may be shortened or lengthened) through a one-time test with hourly or transducer readings.
- If the well cap is tight and unvented, ensure that water levels are at equilibrium by checking water levels multiple times.
- Measure from the defined reference point to groundwater using an electric water level sounder, steel tape, or a datalogging pressure transducer, to the nearest 0.01 foot. Measure twice to ensure accuracy.
- Clean tapes after use at every well to prevent contamination.
- If using a pressure transducer, data must be corrected for atmospheric pressure if not automatically performed by the device.
- Transducer data must be confirmed with regular hand measurements.
- Record data on a field form, which should include the following information
    - Name of person performing monitoring
    - Date and time
    - Well name
    - Date and time pump was turned off, if applicable
    - Depth to groundwater (pumping level before event and static level)
    - Pump flow rate before and after event
    - Equipment used (e.g., sounder, steel tape, portable air line etc.) including specific unit, if applicable
    - Notes, such as odors, wellhead problems, etc.

GROUNDWATER QUALITY

Sampled wells should have basic information on file, including:

- Location, with projection information and source (surveyor or GPS)
- Elevation of reference point for measurement and ground surface, with datum information and source (surveyor or GPS)
- Depth from reference point to screen interval
- Depth from reference point to the bottom of the well
- Lithology and well construction information

Water Level

The water level shall be measured in the well prior to purging or sampling. Clean tapes after use at every well to prevent contamination. See the previous section for methods.

Purging

Sampling shall be performed following purging of the well casing or through appropriate low-flow or no-purge techniques.

Purging is important to ensure that the sample represents water quality in the formation surrounding the well, rather than water quality within the well casing, which may not be representative due to materials used in the well construction process or due to differences in environmental conditions, such as oxidation-reduction potential, between the water in the well casing and water in the formation. Purging attempts to remove all standing water in the well casing and replace it with water from the formation. Field monitoring can be performed to establish stabilization of certain parameters, such as pH, temperature, turbidity, and dissolved oxygen, but for simplicity at least 4 casing volumes of water will be purged prior to sampling. The volume of water is intended to remove water in the filter pack in the borehole in addition to the water in the casing itself. The casing volume can be calculated by the following formula:

$$V = 0.0408d^2 * (t - w)$$

Where:

V = volume of water in the casing
d = well diameter [in]
w = depth to water [ft]
t = total depth [ft]
0.0408 = constant that converts units to gallons, and diameter into radius, and incorporates pi.

Purging can be performed using a pump or bailer.

Sampling

After purging, collect the sample using methodology appropriate for the sampler (e.g., pumping, bailing, diffusion bag). Clean all equipment as appropriate.

Field QA/QC Samples

Given the nature of the ambient monitoring needed for the GWMP, these samples may not be necessary unless required by regulatory guidelines.

Sampling agencies may adopt Field QA/ QC samples if desired. These samples can include field duplicates, trip blanks, field blanks, and rinsate samples. Field duplicates can be used to estimate the precision associated with sampling procedures. Trip blanks, field blanks, and rinsate samples can help monitor potential contamination from shipment, field conditions, and decontamination procedures, respectively.

Records

Field records include usage of a field notebook and Chain-of-Custody as well as labels for the samples. All items should be completed in blue or black indelible ink. The field notebook should include:

- Name of person performing monitoring
- Well name
- Date and time of sample
- Water level prior to sampling
- Depth to bottom of well
- Calculated volume of water in the casing
- Purge method
- Volume purged
- Analysis required for each sample
- Equipment used (e.g., type of pump and specific unit, if applicable)
- Notes, such as odors, wellhead problems, etc.

The Chain-of-Custody and labels should include:

- Name of person performing monitoring
- Agency name
- Well name
- Date and time of sample
- Analysis required for each sample
- Preservatives in the sample bottle, if any

SHIPPING

Samples requiring shipment to a laboratory will be packaged to avoid damage to the containers and cooled with ice to 4 degrees Celsius if required for the analytical method(s). As the nitrate analysis has a 24 hour holding time, samples will be delivered to the laboratory immediately either by courier or hand-delivered

ANALYTICAL METHODS

Most water quality sampling will be performed for Title 22 compliance and will use the analytical methods prescribed by the Department of Public Health (DPH).

Additional analytes for coastal wells may use the methods listed below

Analyte	Method	Required Volume and Container
Alkalinity	EPA 310.1	1 L Poly, Unpreserved
Bicarbonate	EPA 310.1	
Bromide	EPA 300.0	
Chloride	EPA 300.0	
Conductivity	EPA 120.1	
Nitrate	EPA 300.0	
Ortho-phosphate	EPA 365.2	
pH	EPA 150.1	
Sulfate	EPA 300.0	
TDS	EPA 160.1	
Boron,	EPA 6010B	250 ml Poly, with HNO_3 Preservative
Calcium,	EPA 6010B	
Magnesium,	EPA 6010B	
Potassium	EPA 6010B	
Sodium	EPA 6010B	

LABORATORY QUALITY CONTROL

The laboratory selected for analysis will be certified by DPH and will adhere to

- 21 CFR Part 58, *Good Laboratory Practices*
- Criteria in *Methods for Chemical Analysis of Water and Wastes*, 1983 (EPA-600/ 4-79-020)
- Procedures in SW-846 *Test Methods for Evaluating Solid WastC-Physical/Chemical Methods*, 3rd Edition, 1994
- Criteria in 40 CFR 136 *Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act*

Laboratory quality control will be the standard quality control of the selected laboratory.

SECTION 3 SURFACE WATER FLOW AND QUALITY

While this Groundwater Management Plan focuses on groundwater, surface water is closely linked with both groundwater quality and quantity and requires monitoring to track Basin Management Objectives for the Groundwater Management Plan. The former stream gage on Colma Creek is no longer active. The benefits and costs of returning this gaging station to service will be investigated.

Groundwater production is currently monitored by the water purveyors well owners and reported in annual reports for the Westside Basin. Private groundwater production is not reported. Attachment 1 includes information for the development of a voluntary groundwater monitoring network which could include the voluntary installation of meters on private wells.

Agencies, and willing private well owners, will report monthly data to support ongoing analysis and management of the basin.

SECTION 5 LAND SUBSIDENCE

Monitoring for land subsidence is under consideration for future activities. Monitoring may include land surveys, extensiometers, or Satellite Interferometric Synthetic Aperture Radar (InSAR).

ATTACHMENT 1
VOLUNTARY GROUNDWATER MONITORING MATERIALS

The materials on the following pages are for use in development of a voluntary groundwater monitoring network for owners of private wells in the South Westside Basin. This program will be developed through the implementation of the Groundwater Management Plan.

South Westside Basin
Voluntary Groundwater Monitoring Program

Thank You!

Thank you for your interest in the South Westside Basin Voluntary Groundwater Monitoring Program (VMP). The VMP is:

- Fully voluntary. You may choose to enter or leave the program at any time. You may choose to participate in all or a portion of the program.
- Important for ongoing studies of basin groundwater. Existing data is limited to public agency wells, leaving critical data gaps.

This program is based on similar other efforts across California, notably a program by the Sonoma Valley Water Agency.

VMP Components

There are two components to the VMP: groundwater level monitoring and groundwater production monitoring.

Groundwater Level Monitoring

A lack of groundwater level data results in an inability to fully assess patterns and trends in groundwater levels and groundwater in storage and also reduces the accuracy with which a groundwater model can be developed.

If you choose to participate in the groundwater level monitoring program, a groundwater monitoring technician, which will be trained agency staff, will coordinate prior to each monitoring event. Monitoring will occur twice per year: once in April and once in October. The measurements will be included in annual reports, groundwater modeling efforts, and other groundwater planning efforts. If desired, the local well name can be replaced with "Private Well ##" on the reports.

Groundwater Production Monitoring

A lack of groundwater production data requires usage of estimated production data based on land use and climatic data for use in developing an understanding of inflows and outflows from the basin and for use in the development and refinement of the numerical groundwater model. These estimates may not properly represent actual production or water levels.

If you choose to participate in the groundwater production monitoring program, agency staff will coordinate the installation of a meter for your pump if needed, free of charge. The meter will be read by trained agency staff on the last business day of each month, or on an alternate schedule as desired by the participant. Installation is contingent on available funding for this program.

Data Usage

The data gathered by this program is critical for the implementation of the South Westside Basin Groundwater Management Plan (Plan). The Plan set management strategies to achieve a sustainable, high-quality, reliable water supply at a fair price for beneficial uses through local groundwater management. The implementation of the plan is dependent on an accurate understanding of current and past conditions and the ability to monitor conditions in the basin moving forward.

The existing understanding of the basin is based on groundwater production, elevation, and quality data from municipal wells. Similar information for private groundwater producers (including cemeteries, golf courses, and others) is not available; therefore estimates must be made for based on likely water use and other parameters. These estimates may not accurately reflect real world operations.

The addition of groundwater data from the wells of private groundwater producers will assist in overall groundwater management of the basin. These data will be used in enhancements of the numerical groundwater model and in analysis of trends over time and space. In turn, this will improve the ability to determine impacts and benefits from management strategies to address concerns regarding groundwater levels, groundwater quality (nitrate, TDS, fuels, and solvents), seawater intrusion, and others to help protect the groundwater resource.

How to Participate

Participation in this program is fully voluntary, at no cost to the well owner, and greatly appreciated.

To utilize information collected, some basic information on the well is required, and some additional information is very helpful. This information is requested on the following Well Information Form. We ask that you complete this form and return it to the contact below.

Water levels in wells in the program will be measured twice a year, once in the fall and then again in the spring. Measurement data will be provided to you the well owner within one week of the visit. Additionally, you will receive, on an annual basis, a report on the South Westside groundwater basin summarizing the results of the monitoring and progress on the groundwater management program.

Monitoring personnel may be employees of the City of Daly City, City of San Bruno, California Water Services Company, Town of Colma, or the San Francisco Public Utilities Commission., collectively the Westside Basin Partners. For a monitor to enter your property, a "Permit to Enter" agreement needs to be completed by the property owner and the Westside Basin Partners. A "**Permit to Enter**" is attached for your review and completion if you chose to participate. Please **fill out two copies** and return to me at the address below. A fully completed and signed original will be sent back to you.

Your efforts in helping with this planned groundwater level monitoring program are greatly appreciated. If you have any questions about the monitoring program please contact TBD at (650) xxx-xxx or xxxx@sanbruno.ca.gov.

Please send forms to:

City of San Bruno
Attn: TBD
567 El Camino Real
San Bruno, CA 94066

South Westside Basin
Voluntary Groundwater Monitoring Program

Well Information

1 Date: (required)____

2 Well Owner's Name: (required) ____

3 Mailing Address of Owner: (required)
____
____

4 Well Physical Address: (required)
____
____

5 Surveyed Coordinates: ____
☐ Not Available

6 Well use (check all that apply)
☐ Residential (inside home)
☐ Residential irrigation
☐ Turfgrass irrigation
☐ Agricultural irrigation
☐ Commercial/Institutional or industrial areas

7 Name & address of water well driller:
____
____
____

☐ Don't know

7. Do you have a copy of the Water Well Drillers' Report.
☐ yes ☐ no
If yes please attach a copy and skip questions 8 through 11.

8. Date well was drilled. Please estimate date if unknown and check estimated box.
_________________ ☐ estimated

9. Total well depth ________ feet ☐ Don't know

10. Depth to top and bottom of perforations/well screen
Top of Well Screen ____________________ feet below top of well casing
Bottom of Well Screen ____________________ feet below top of well casing

11. Well Diameter _______ inches ☐ Don't know

12. Well Usage □ Year-round □ Seasonal Irrigation □ Not in use □ Other (please explain)

13. Pump Flow Rate (please check one) "gpm - gallons per minute"
□ 1 - 5 gpm □ 5 - 25 gpm □ 25 - 100 gpm □ 100- 400 gpm □ greater than 400 gpm □ don't know

14. Depth of pump: ______ feet below top of well casing □ don't know

15. Do you have any water level information for the well? (If yes, please attach copy of water level data): □ yes □ no

16. Do you have any water quality analysis of the well? (If yes, please attach copy of most recent report): □ yes □ no

17. Have you experienced any problems with your well (for example, declining production, water quality issues, etc.)? If so, please note here:

____
____
____
____
____

18. Please add any additional information that you think may be helpful in the monitoring well program (attach additional sheet if necessary).

____
____
____
____
____

South Westside Basin
Voluntary Groundwater Monitoring Program Monitoring Program Permit to Enter

_________________________________(Property Owner), herein called "Grantor", permits the Westside Basin Partners, herein called "Partners", its agents, contractors or assigns, to enter upon that property located at __________________________________(property address) and identified by the San Mateo County Assessor as parcel number(s) __________________________(APN).

Entry to the abovC-referenced parcel will be for the purpose of performing non-disturbing well water elevation measurements on Grantor's property. All wells selected for the program will be measured twice a year, once in the fall and then again in the spring. During the term of this Permit to Enter, Grantor shall notify Partners of any pending transfer of this property within a reasonable time period prior to said transfer.

Agency shall indemnify and defend (with counsel reasonable acceptable to Grantor) and hold Grantor harmless from and against any and all claims, damages, costs, liabilities, losses, and expenses (including reasonable attorneys' fees) arising out of any entry by Partners or its agents or contractors; provided, however, that Partners shall have no obligation hereunder to the extent the claim, liability, or expense arises from the negligence or willful misconduct of Grantor.

Agency shall notify Grantor 48 hours prior to entering Grantor's property.

This Permit to Enter shall terminate on July 31, 2021 or upon written notification by the Grantor.

GRANTOR' S APPROVAL:

By:

Who by his/her signature herein above represents that he/she has been duly vested with authority to sign this instrument on behalf of all owners of record for the subject property.

DATE:

PRINT NAME:

MAILING ADDRESS:

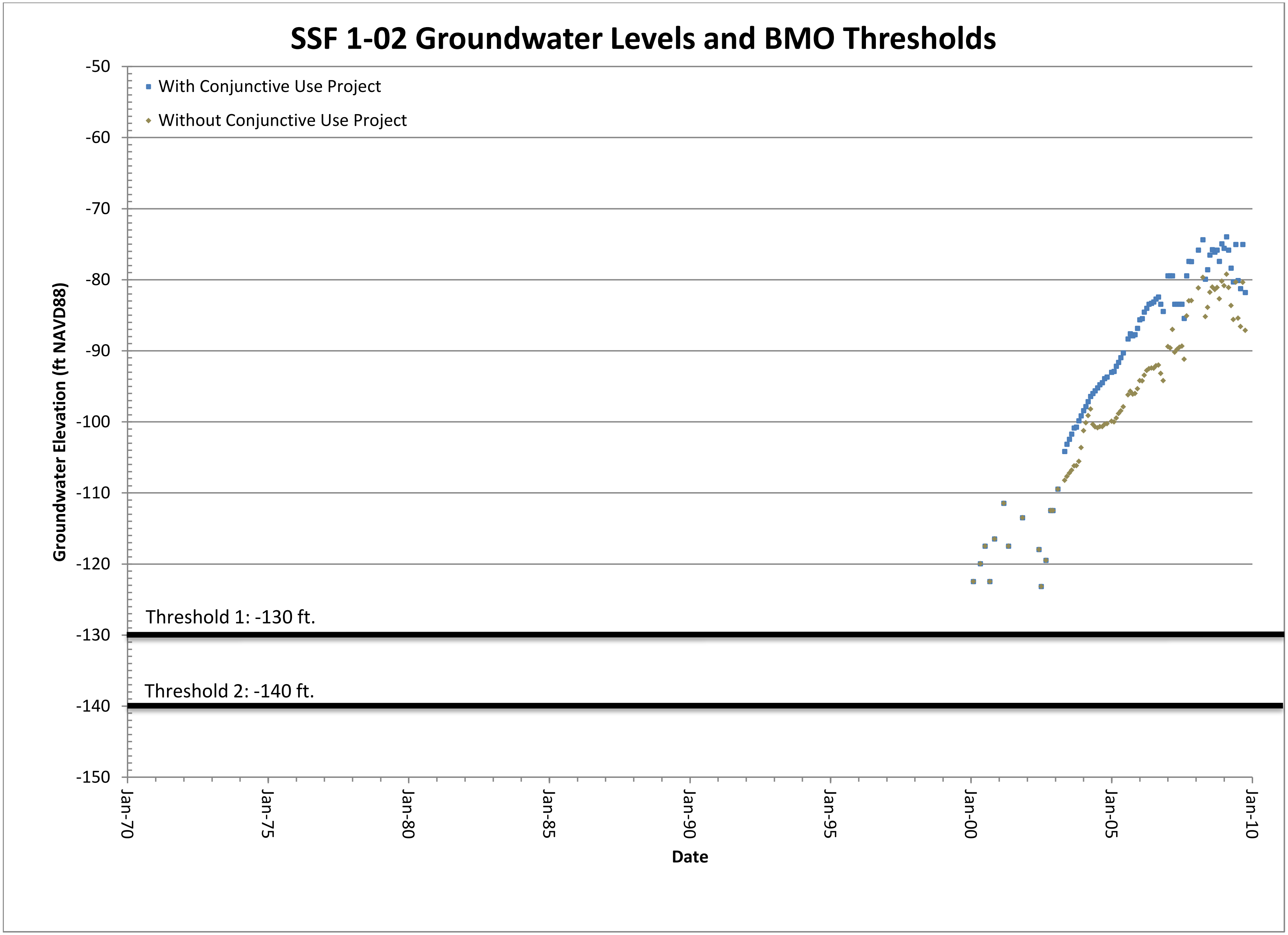
CITY, STATE, ZIP CODE: TELEPHONE

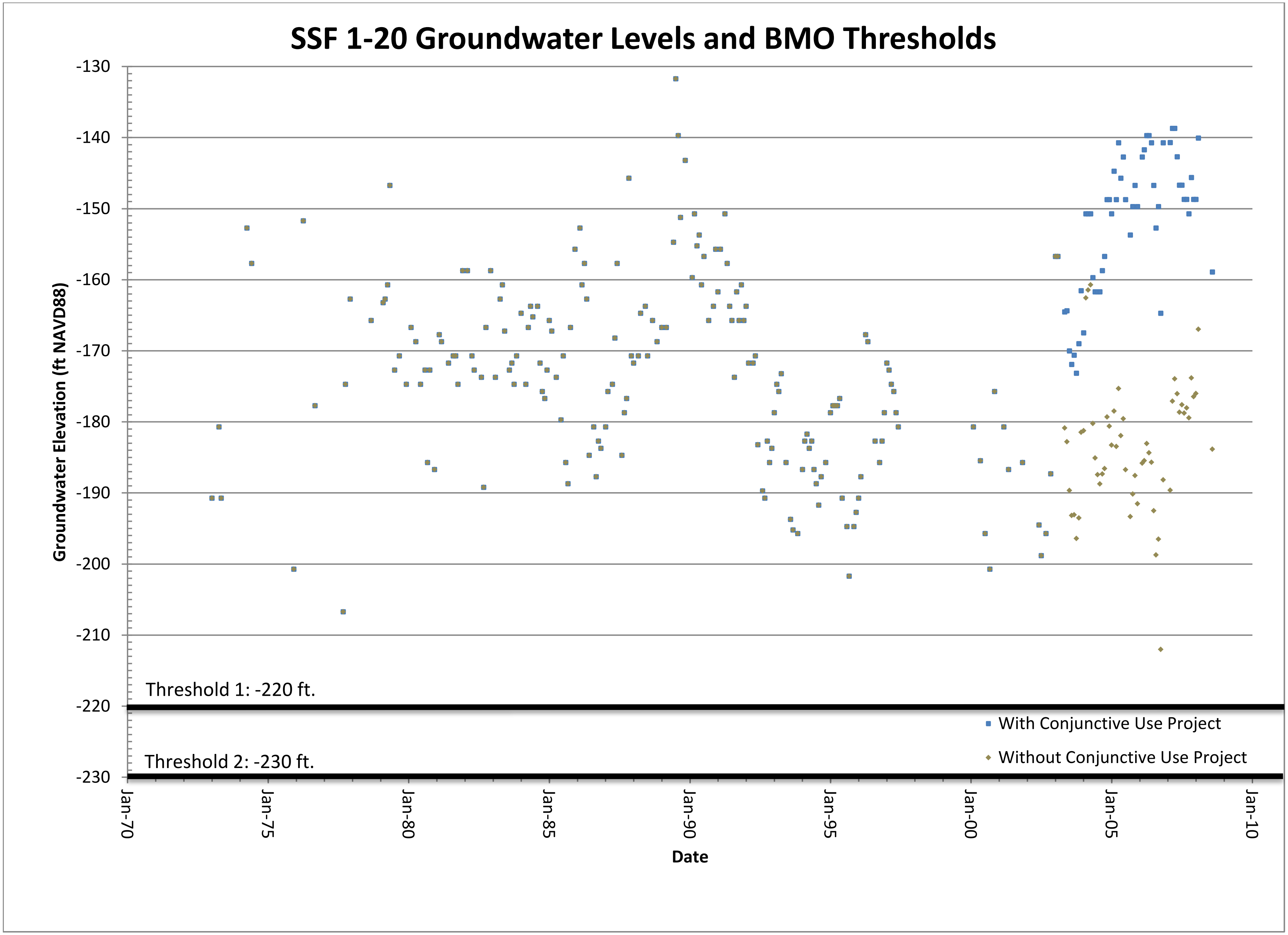
NUMBER(S):

WESTSIDE BASIN PARTNERS ACCEPTANCE:

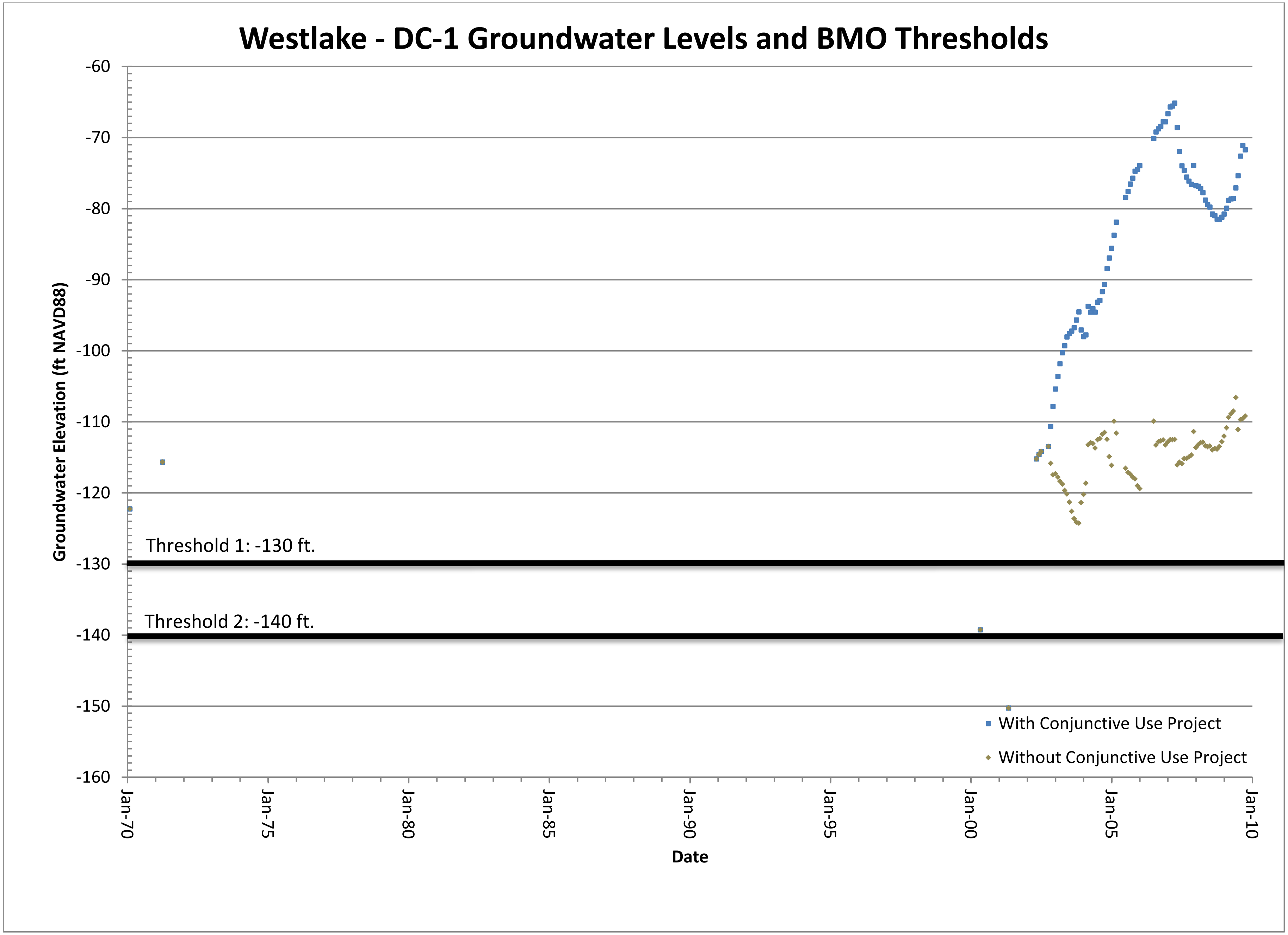
Signature :_____________________________ Date:_______________
NAME --- Titlte --- Agency

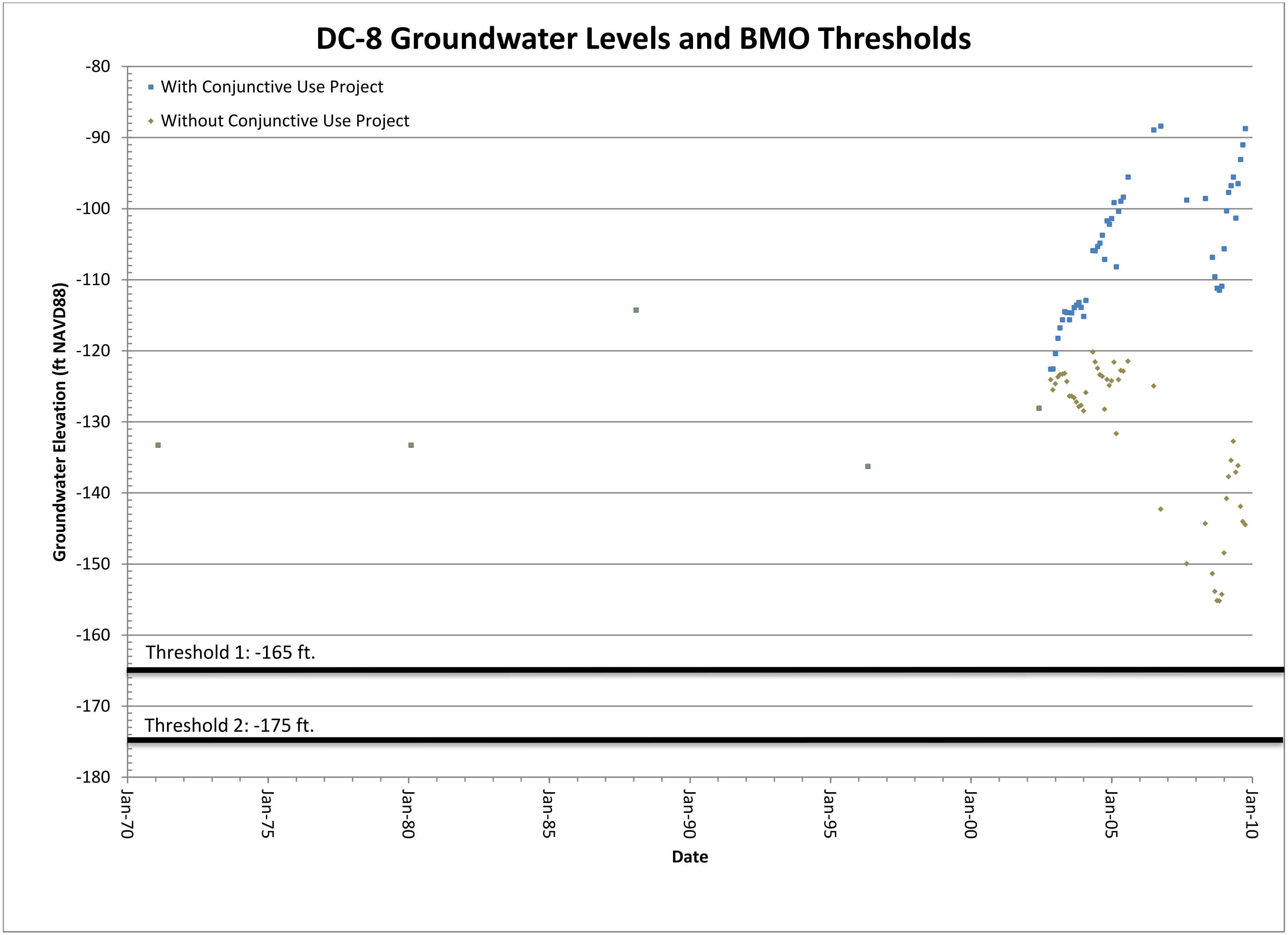
APPENDIX D – BASIN MANAGEMENT OBJECTIVE HYDROGRAPHS


SSF 1-02 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Threshold 1: -130 ft.
Threshold 2: -140 ft.
Groundwater Elevation (ft NAVD88)
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

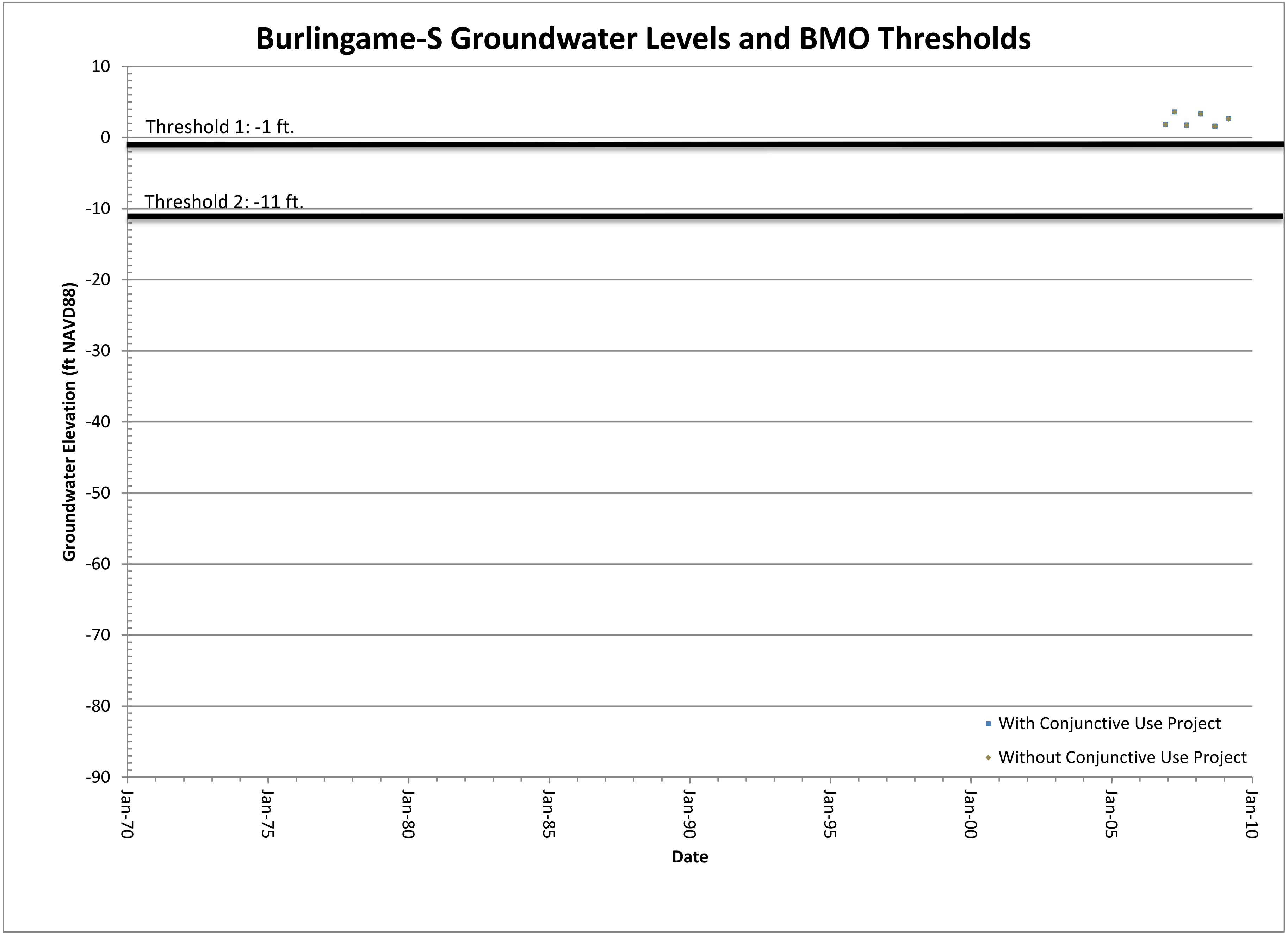


SSF 1-20 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-130
-140
-150
-160
-170
-180
-190
-200
-210
-220
-230
Threshold 1: -220 ft.
Threshold 2: -230 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

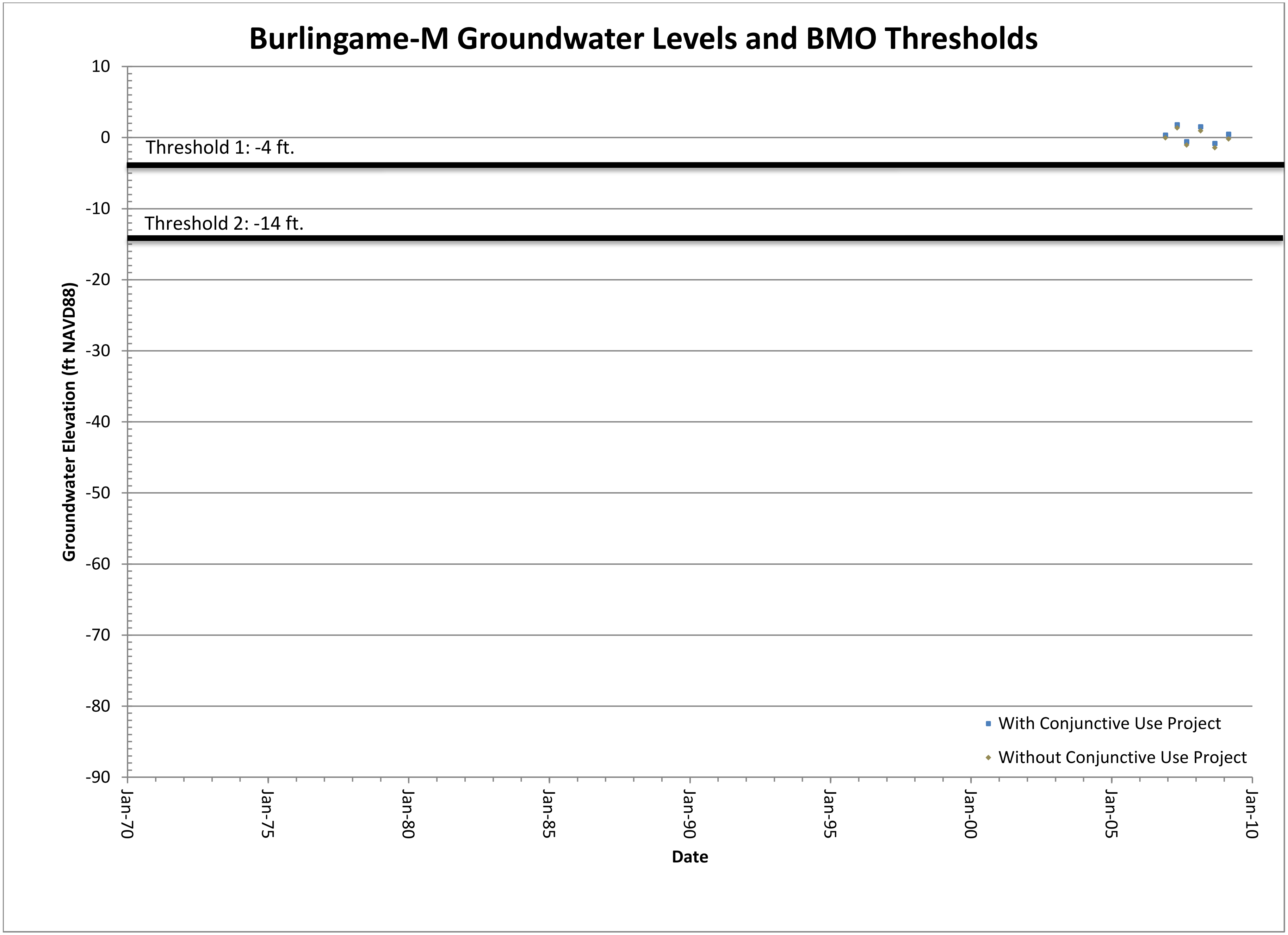

Westlake - DC-1 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
Threshold 1: -130 ft.
Threshold 2: -140 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



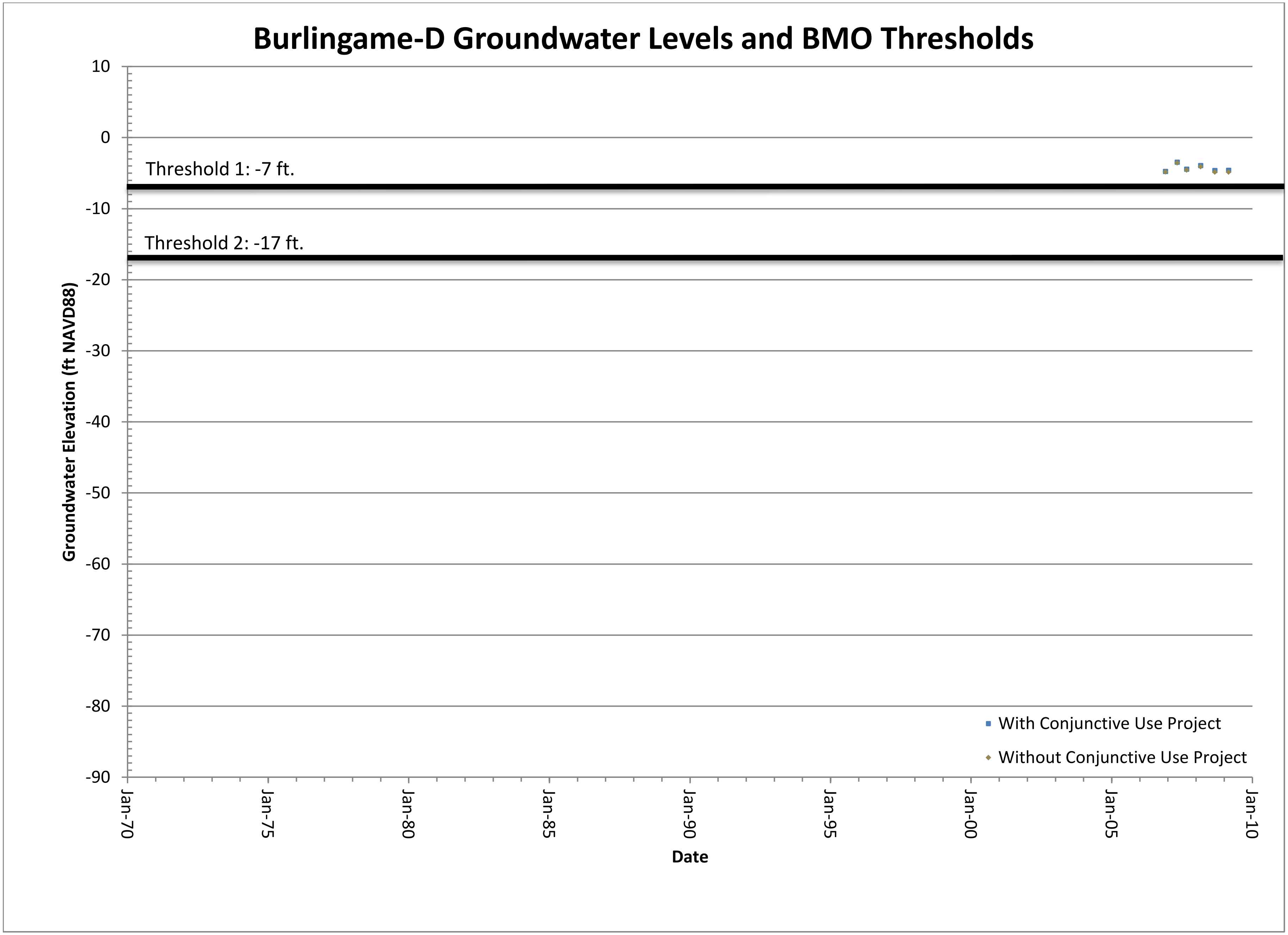
DC-8 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Groundwater Elevation (ft NAVD88)
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
Threshold 1: -165 ft.
Threshold 2: -175 ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



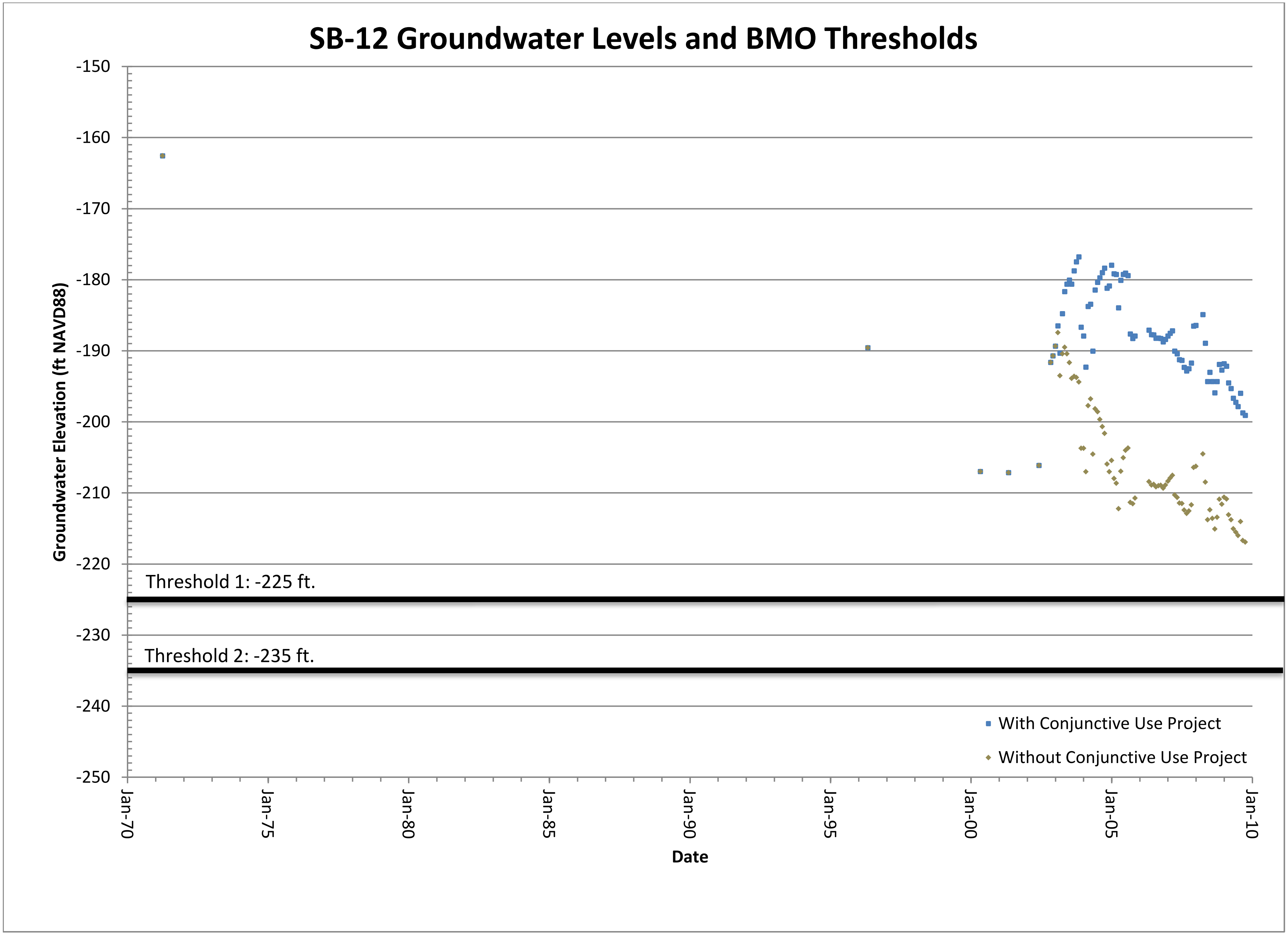
Burlingame-S Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Threshold 1: -1 ft.
Threshold 2: -11 ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

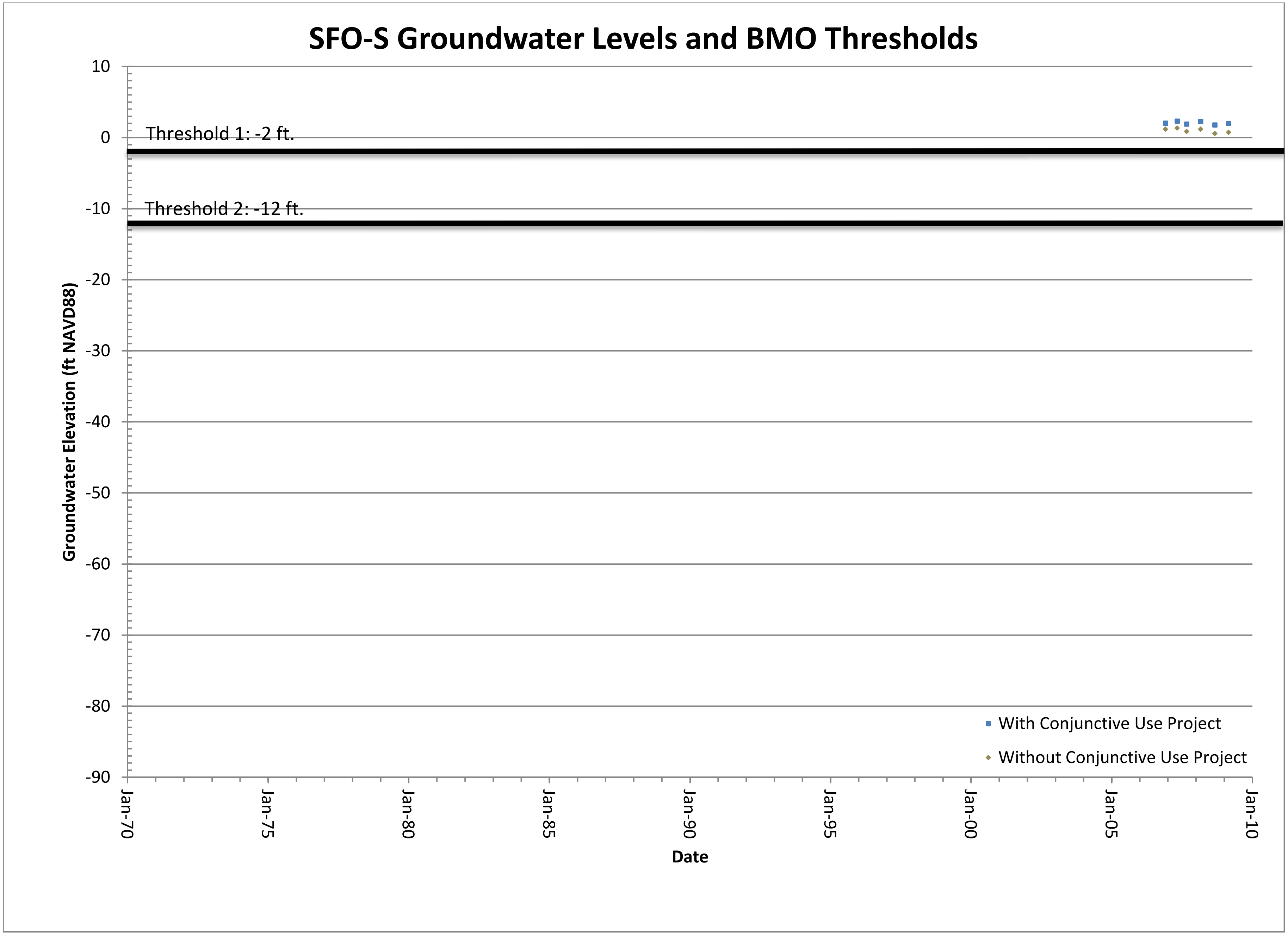


Burlingame-M Groundwater Levels and BMO Thresholds
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Threshold 1: -4 ft.
Threshold 2: -14 ft.
Groundwater Elevation (ft NAVD88)
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

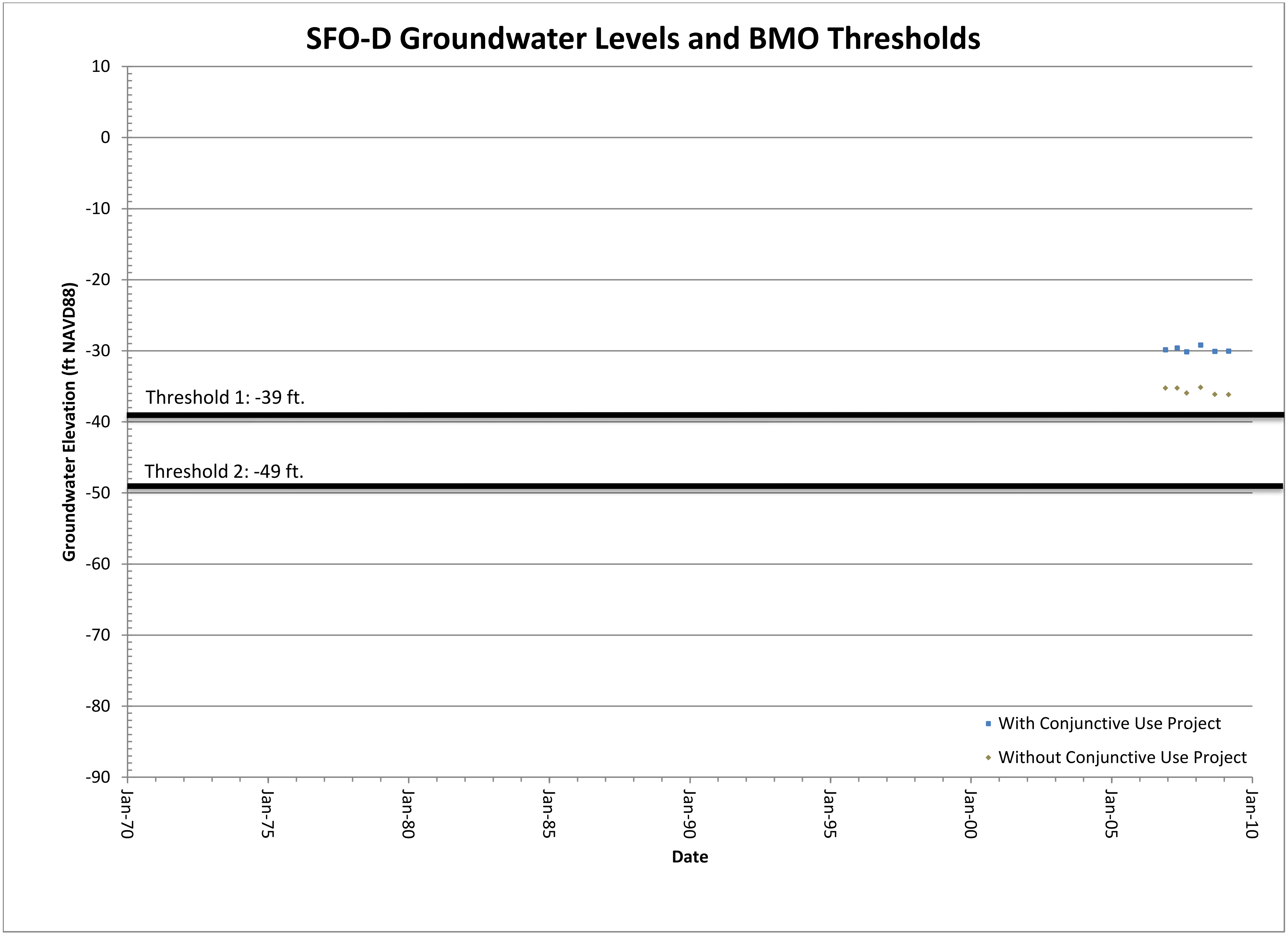


Burlingame-D Groundwater Levels and BMO Thresholds
Threshold 1: -7 ft.
Threshold 2: -17 ft.
Groundwater Elevation (ft NAVD88)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

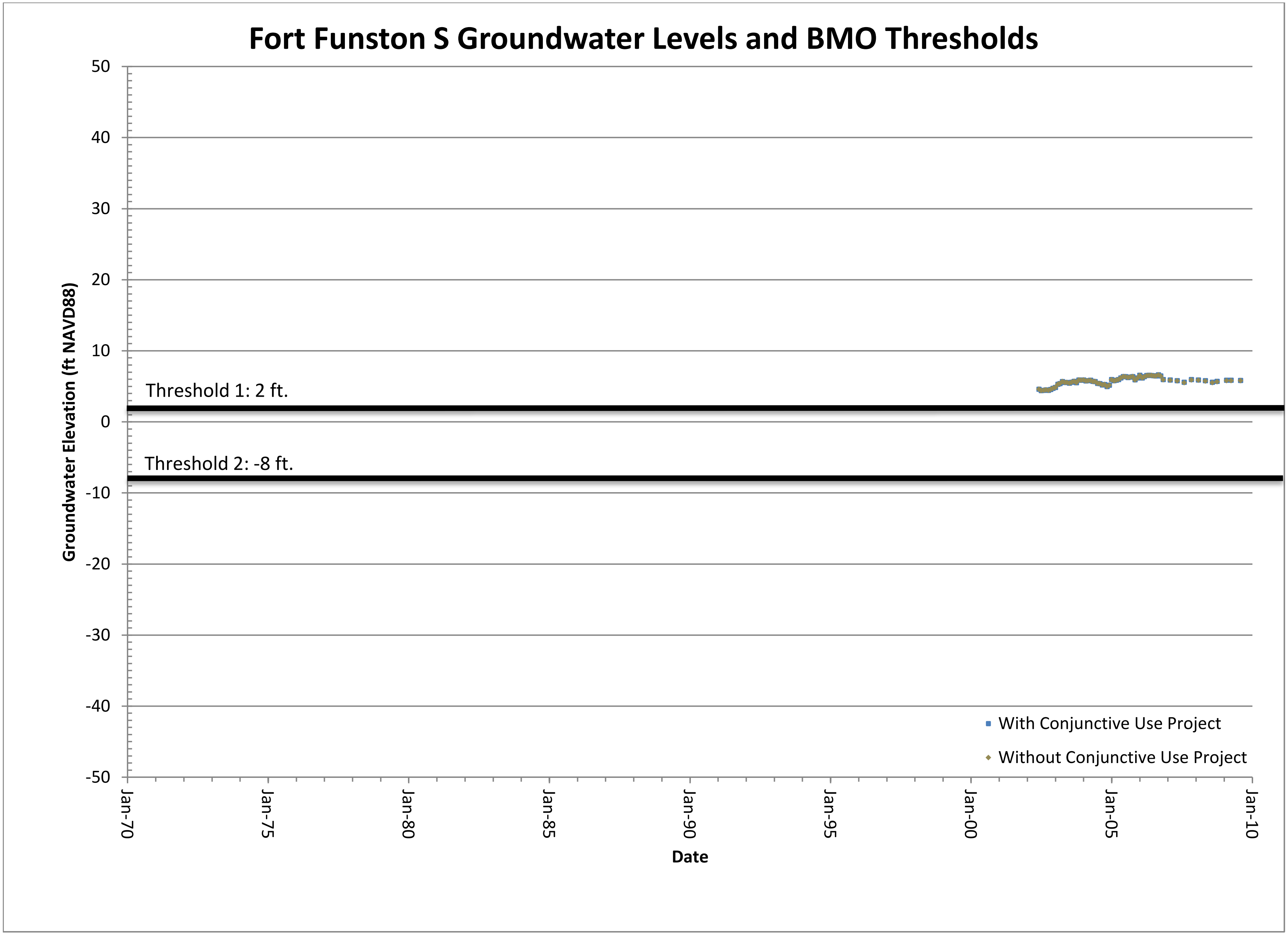

SB-12 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -225 ft.
Threshold 2: -235 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

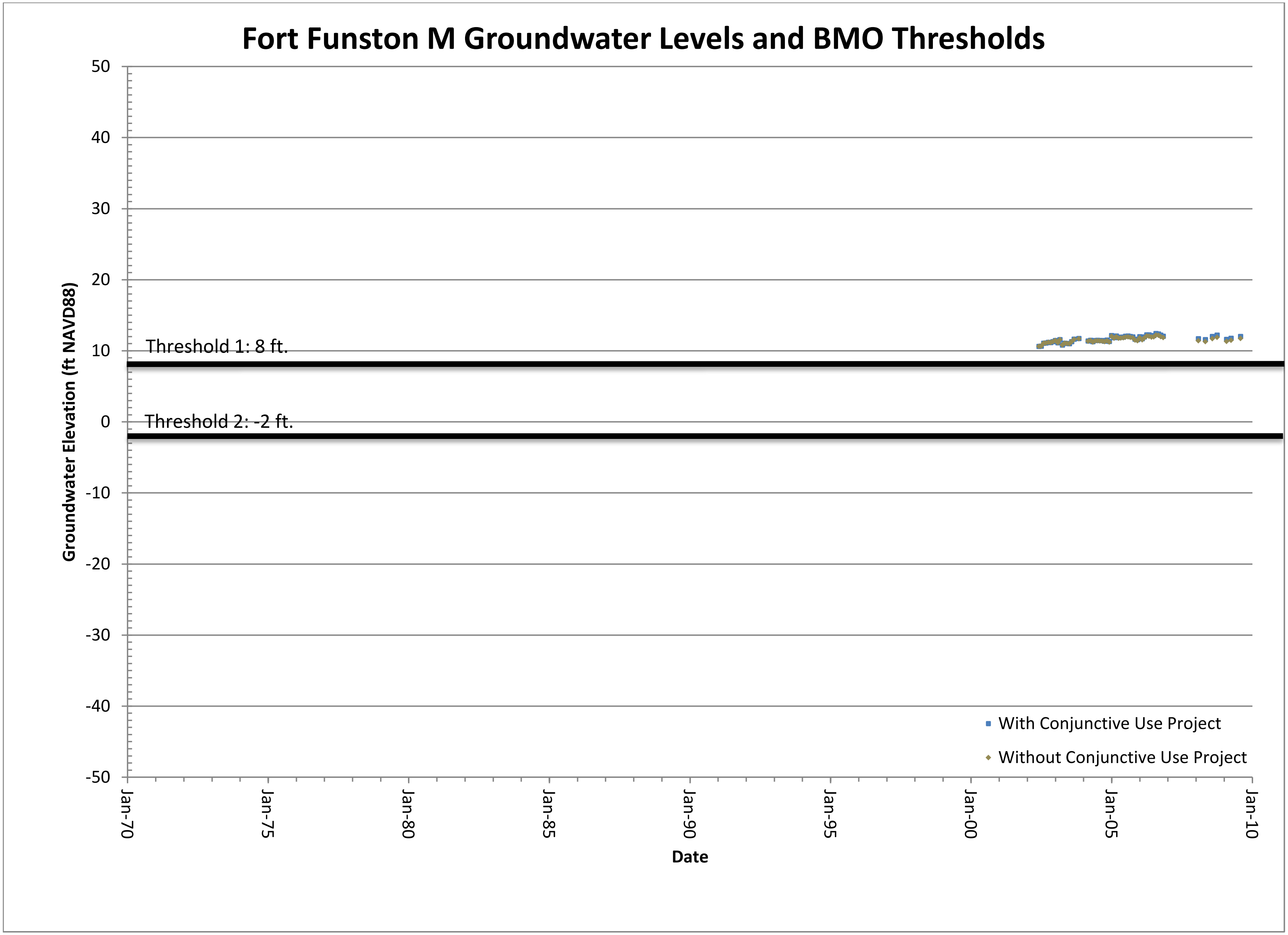


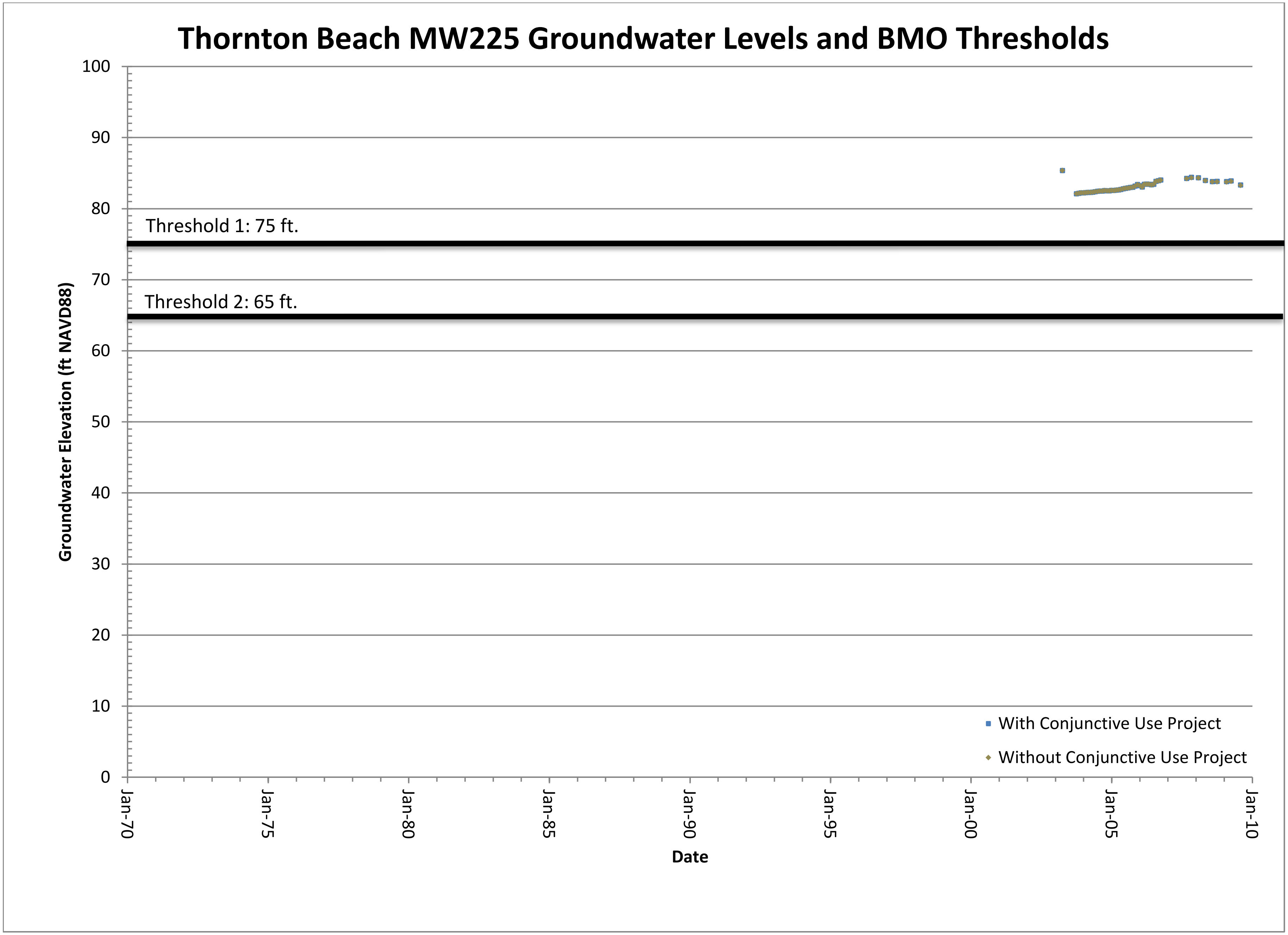
SFO-S Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Threshold 1: -2 ft.
Threshold 2: -12 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



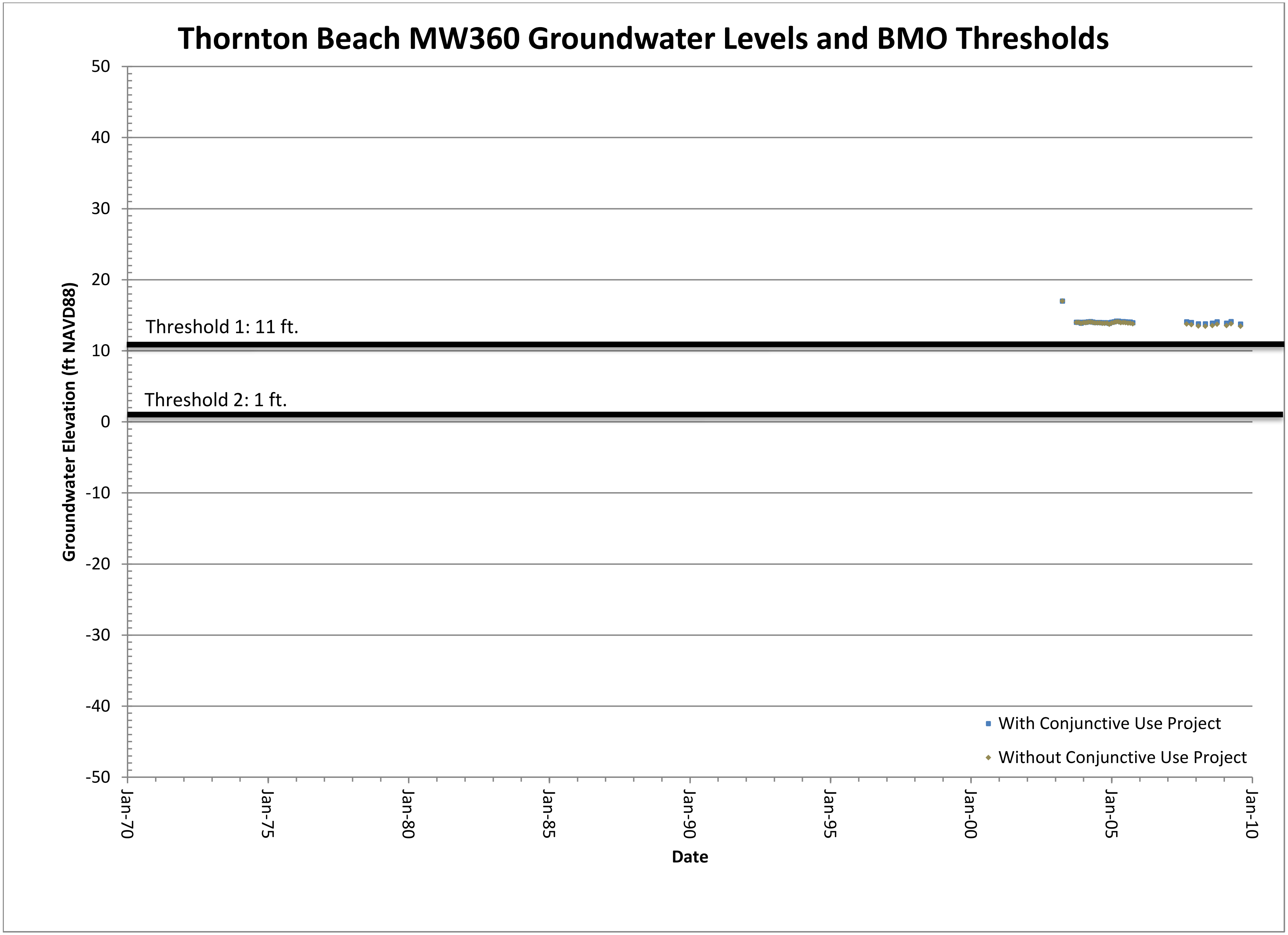
SFO-D Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Threshold 1: -39 ft.
Threshold 2: -49 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


Fort Funston S Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
50
40
30
20
10
0
-10
-20
-30
-40
-50
Threshold 1: 2 ft.
Threshold 2: -8 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

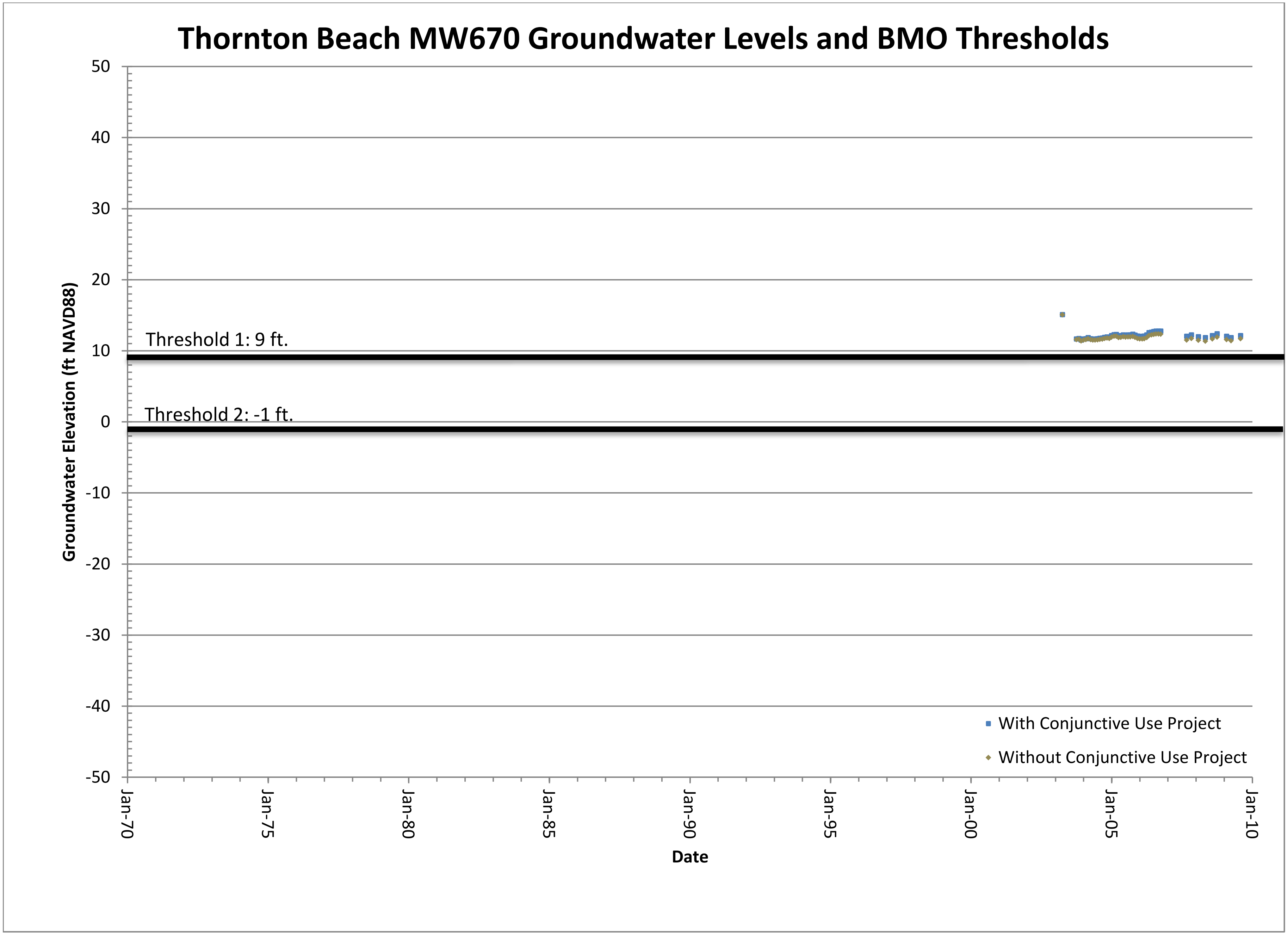

Fort Funston M Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
50
40
30
20
10
0
-10
-20
-30
-40
-50
Threshold 1: 8 ft.
Threshold 2: -2 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



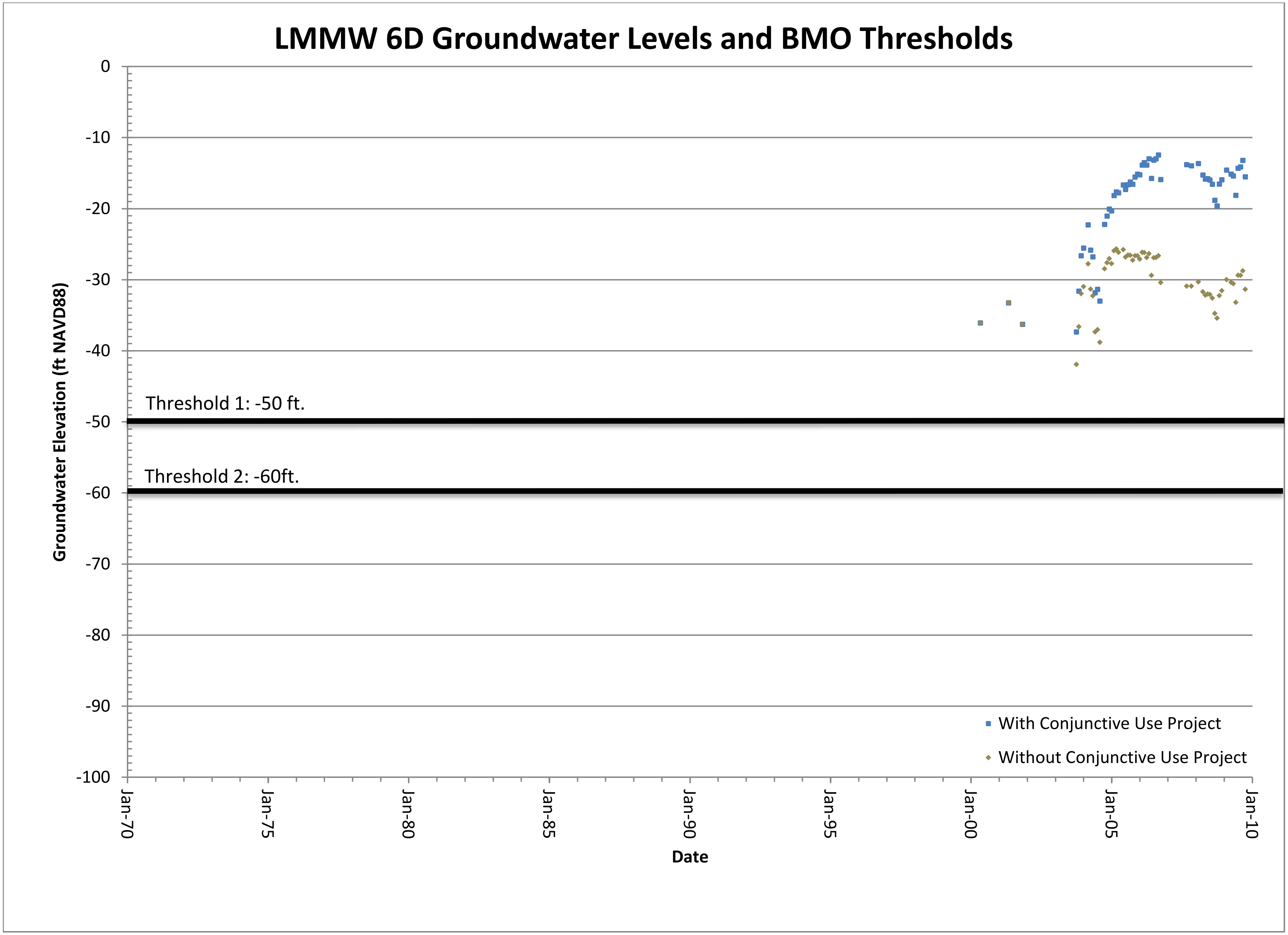
Thornton Beach MW225 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
100
90
80
70
60
50
40
30
20
10
0
Threshold 1: 75 ft.
Threshold 2: 65 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



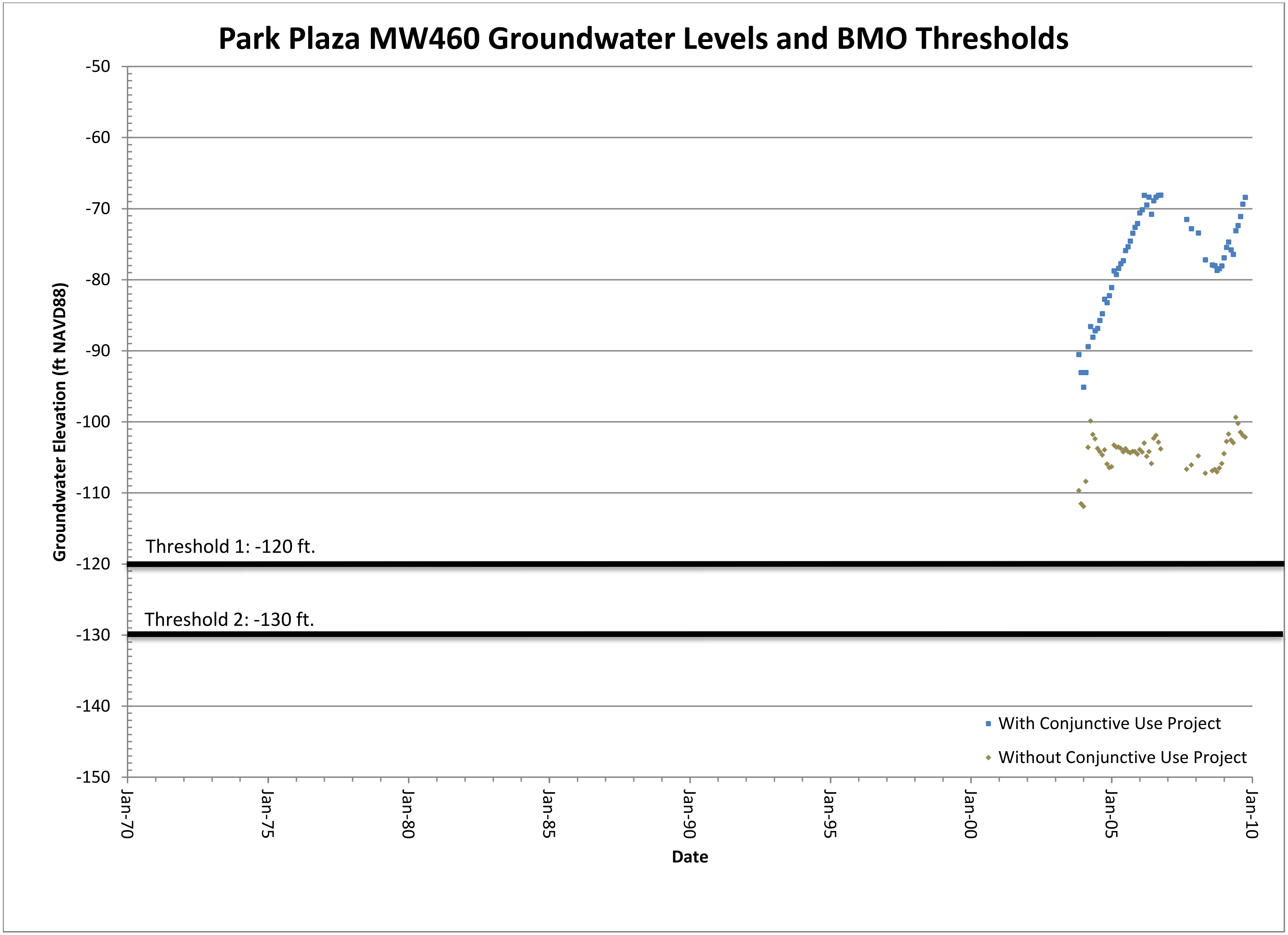
Thornton Beach MW360 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
Threshold 1: 11 ft.
Threshold 2: 1 ft.
50
40
30
20
10
0
-10
-20
-30
-40
-50
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project



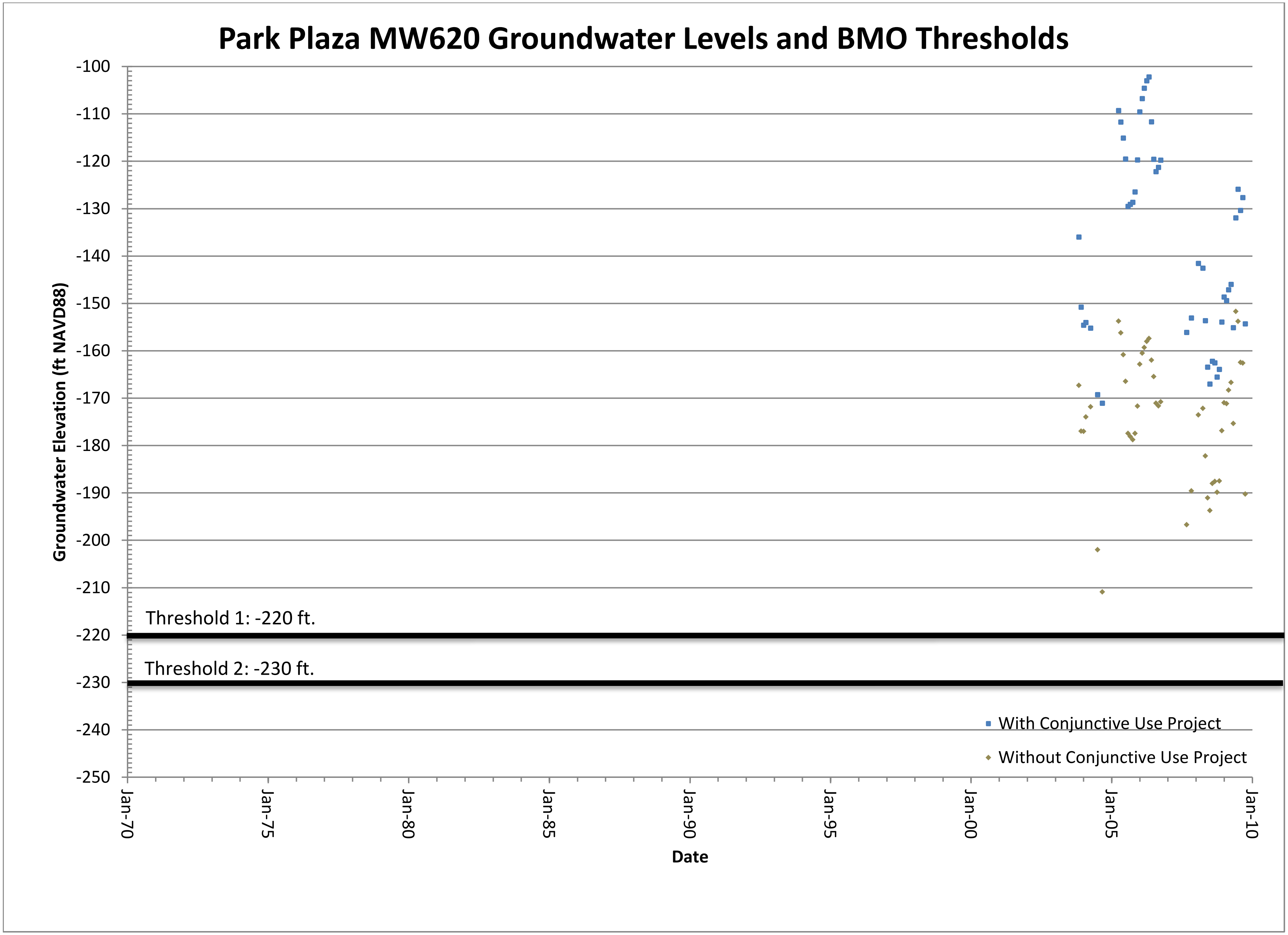
Thornton Beach MW670 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
50
40
30
20
10
0
-10
-20
-30
-40
-50
Threshold 1: 9 ft.
Threshold 2: -1 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

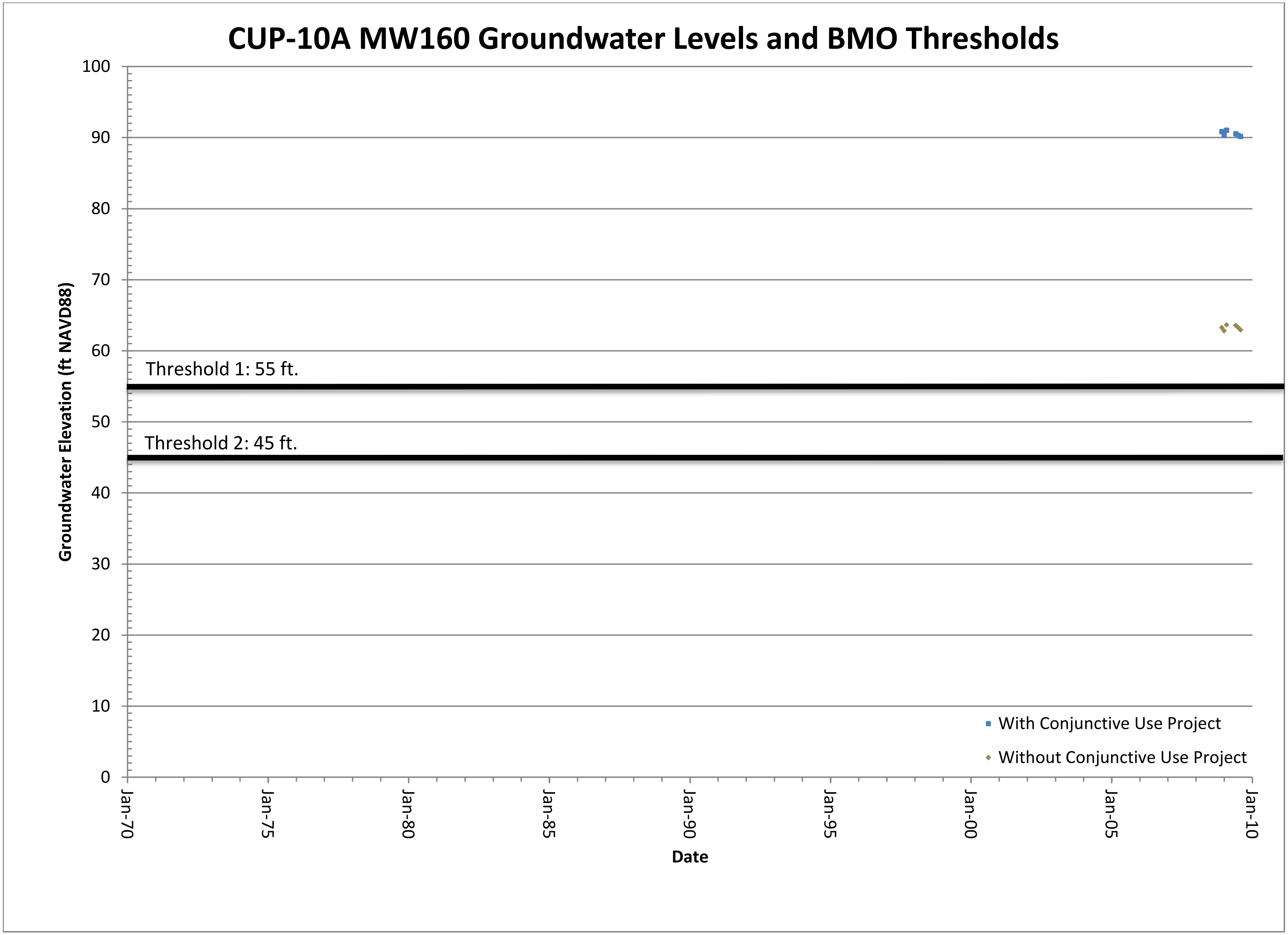


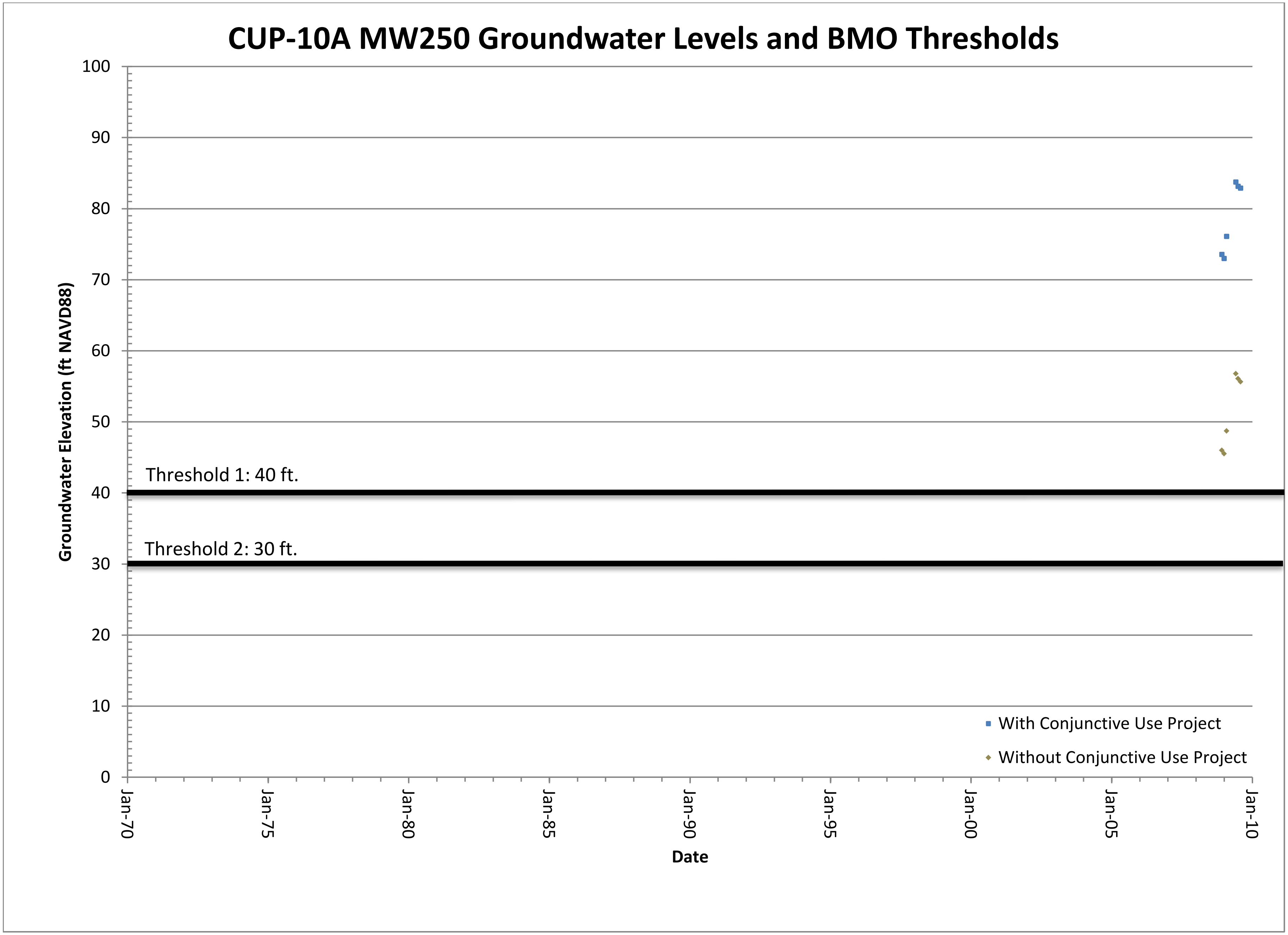
LMMW 6D Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Threshold 1: -50 ft.
Threshold 2: -60ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

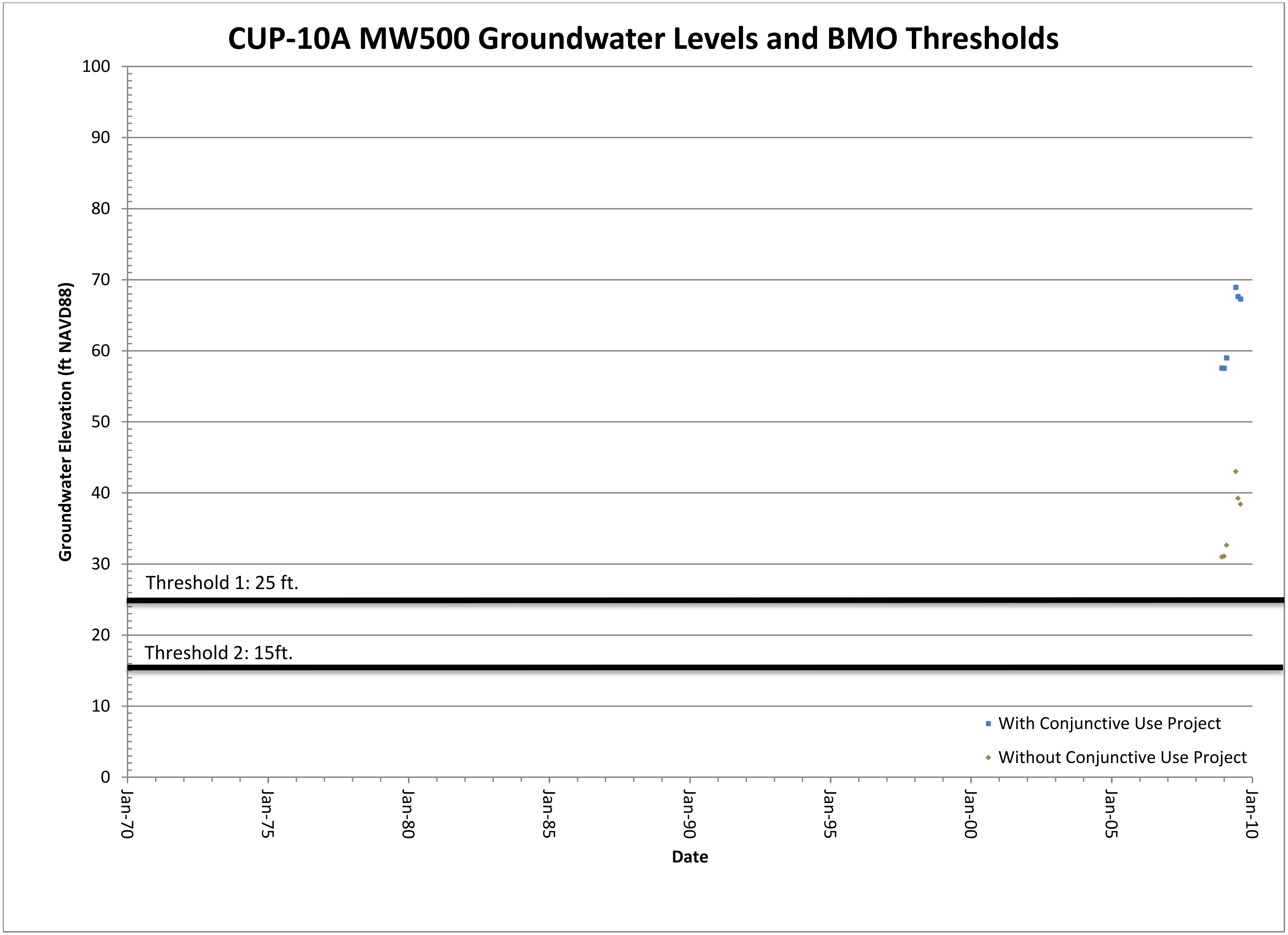


Park Plaza MW460 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
Threshold 1: -120 ft.
Threshold 2: -130 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

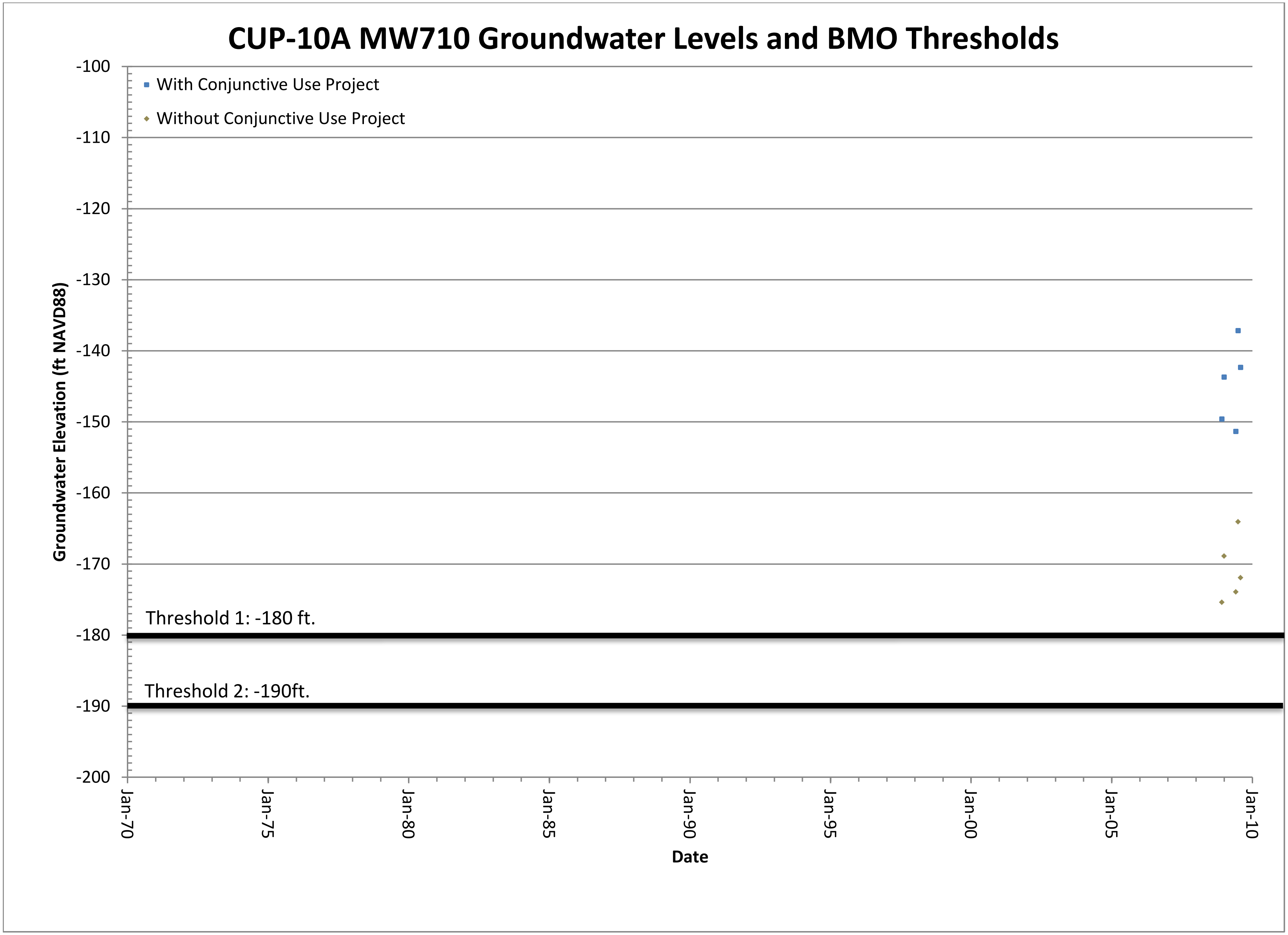

Park Plaza MW620 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -220 ft.
Threshold 2: -230 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


CUP-10A MW160 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
100
90
80
70
60
50
40
30
20
10
0
Threshold 1: 55 ft.
Threshold 2: 45 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


CUP-10A MW250 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
100
90
80
70
60
50
40
30
20
10
0
Threshold 1: 40 ft.
Threshold 2: 30 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

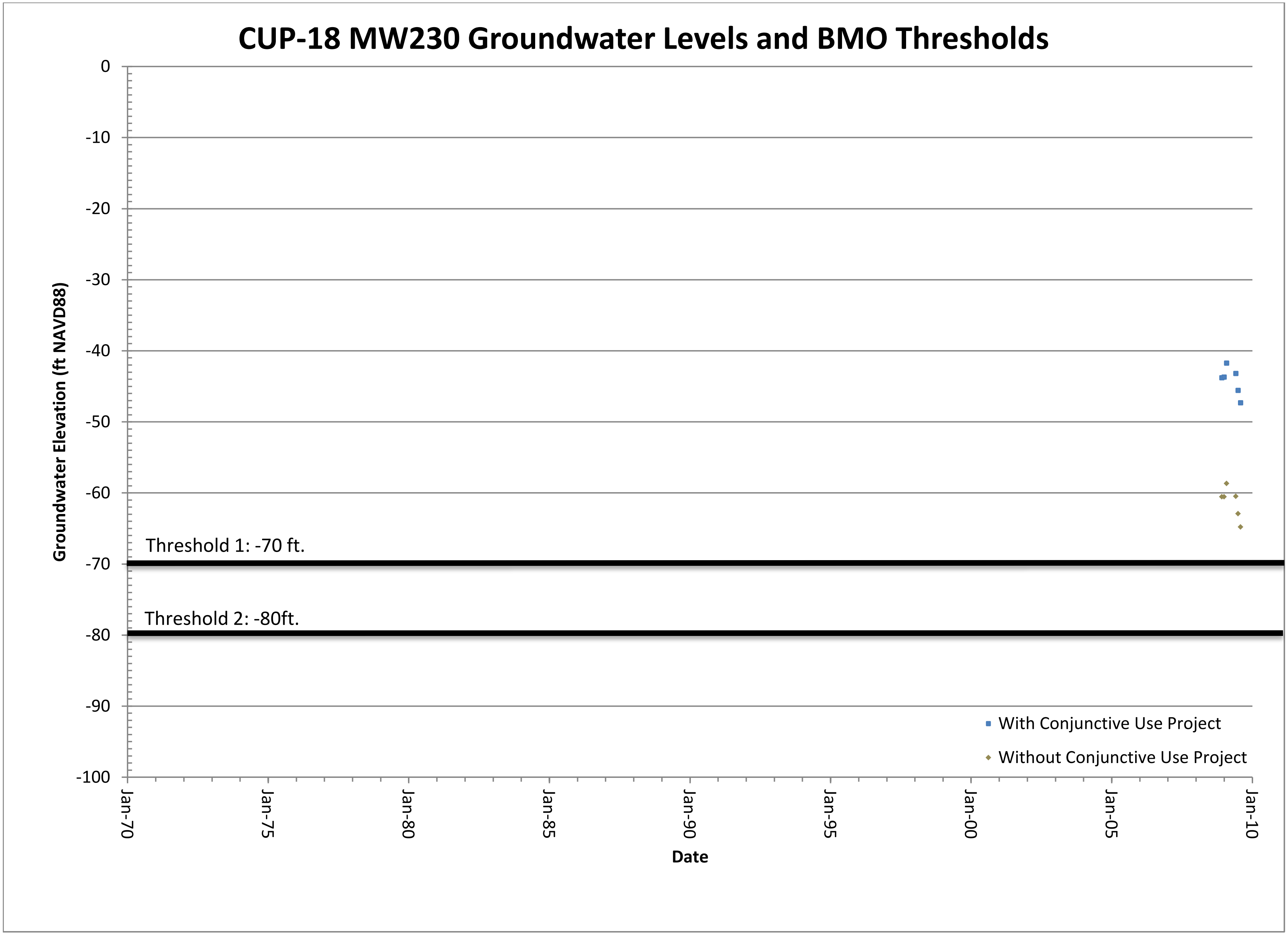


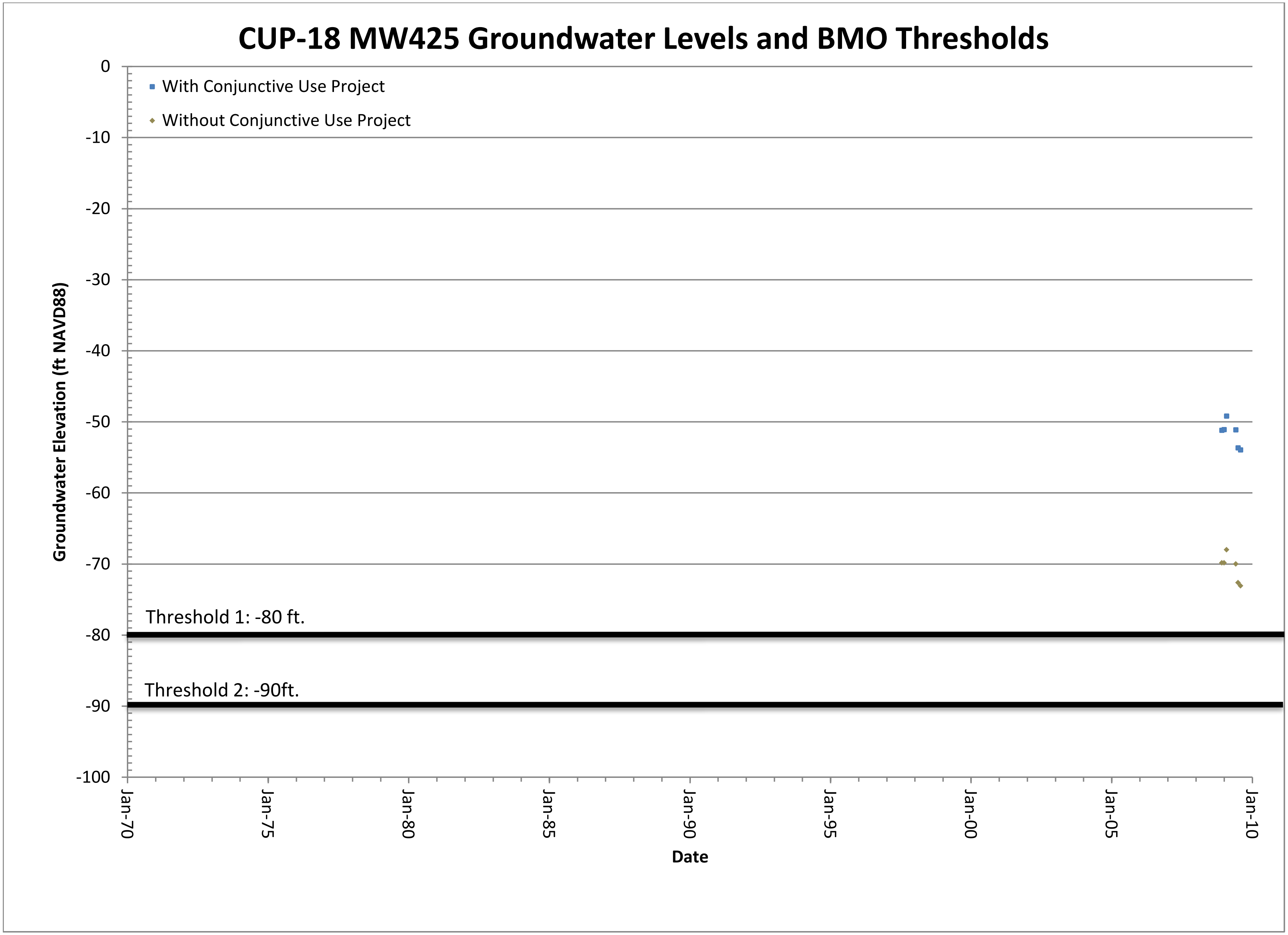
CUP-10A MW500 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
100
90
80
70
60
50
40
30
20
10
0
Threshold 1: 25 ft.
Threshold 2: 15ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

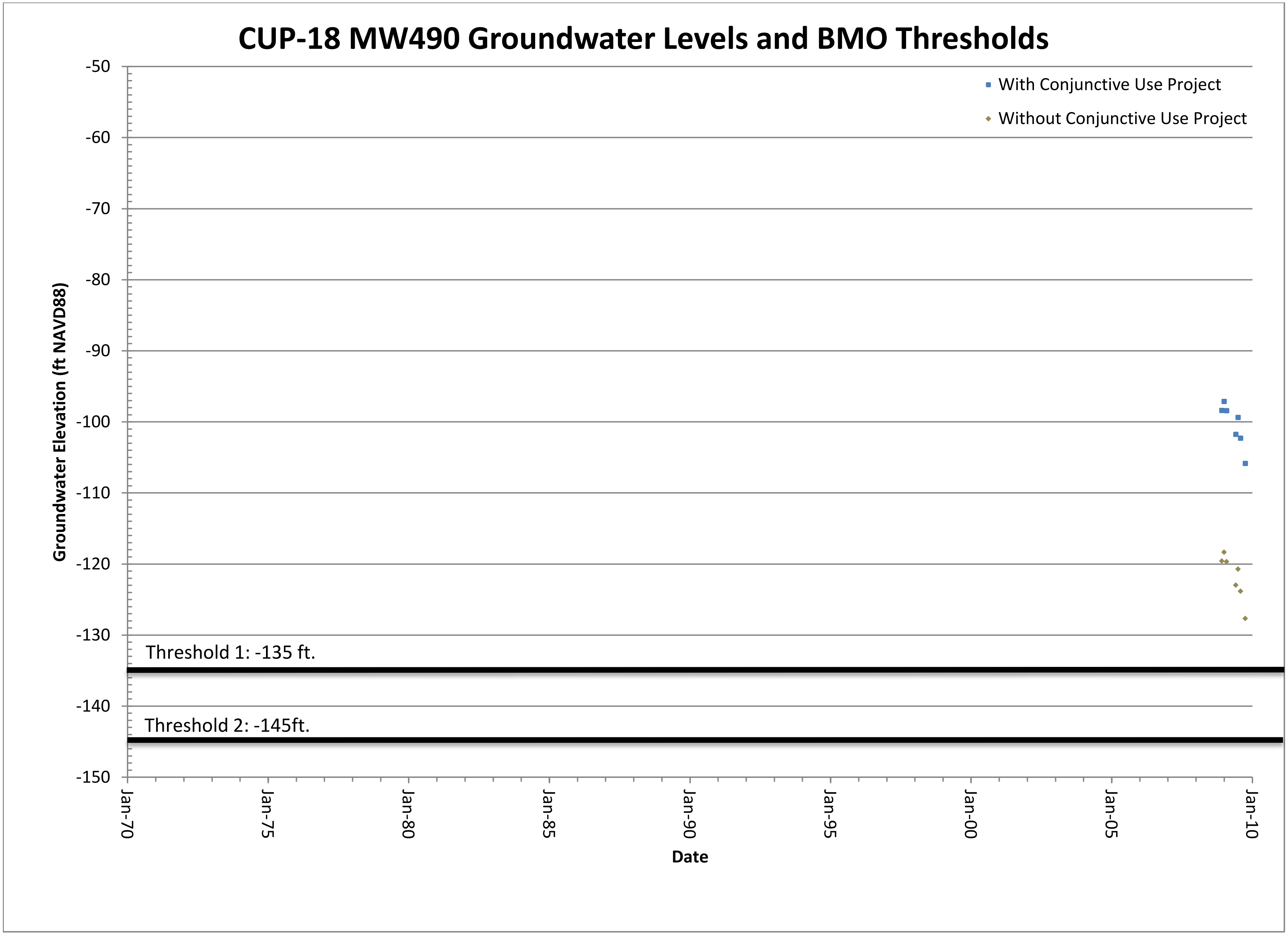


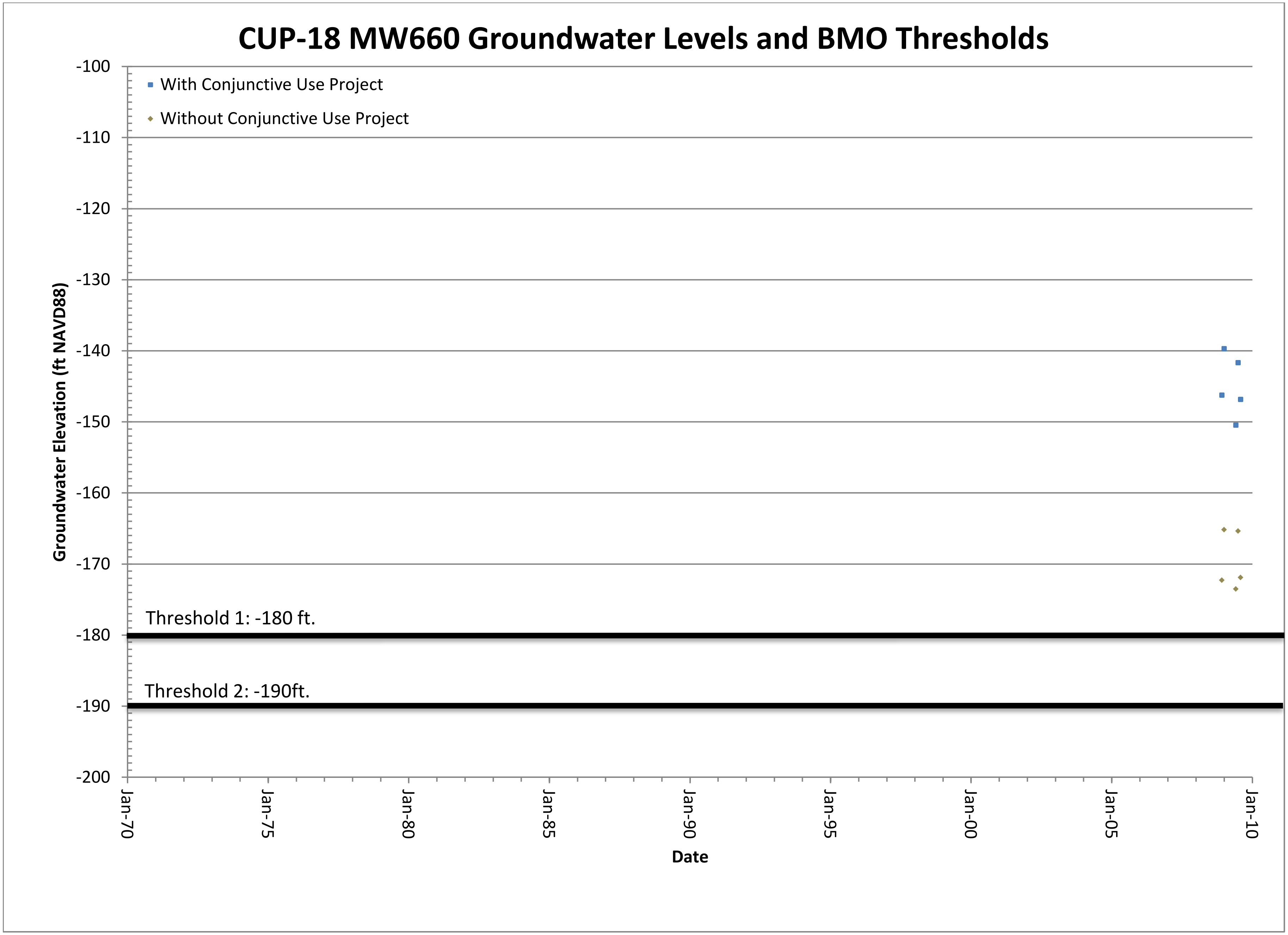
CUP-10A MW710 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Threshold 1: -180 ft.
Threshold 2: -190ft.
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

CUP-18 MW230 Groundwater Levels and BMO Thresholds

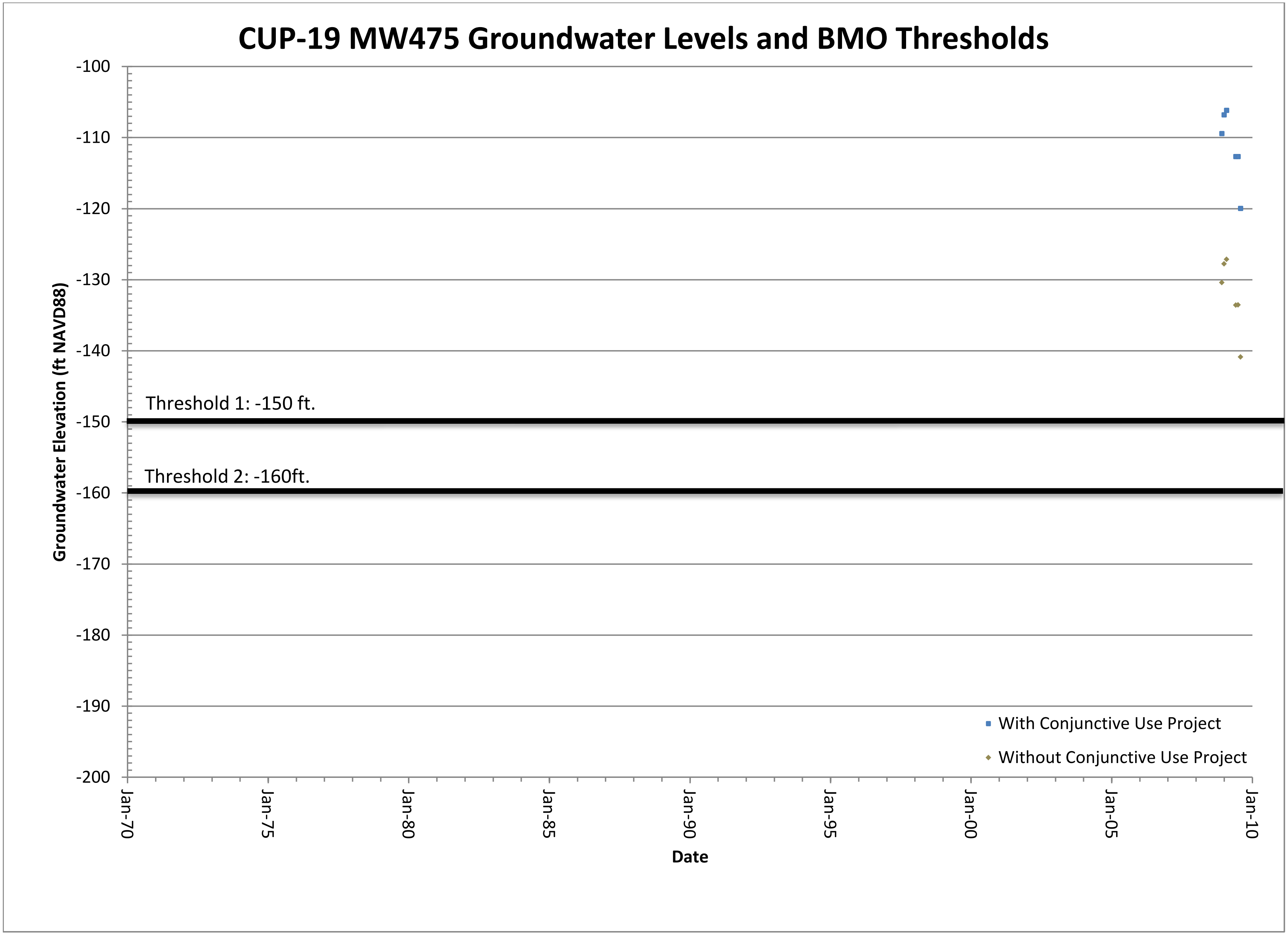



CUP-18 MW425 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Threshold 1: -80 ft.
Threshold 2: -90ft.
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

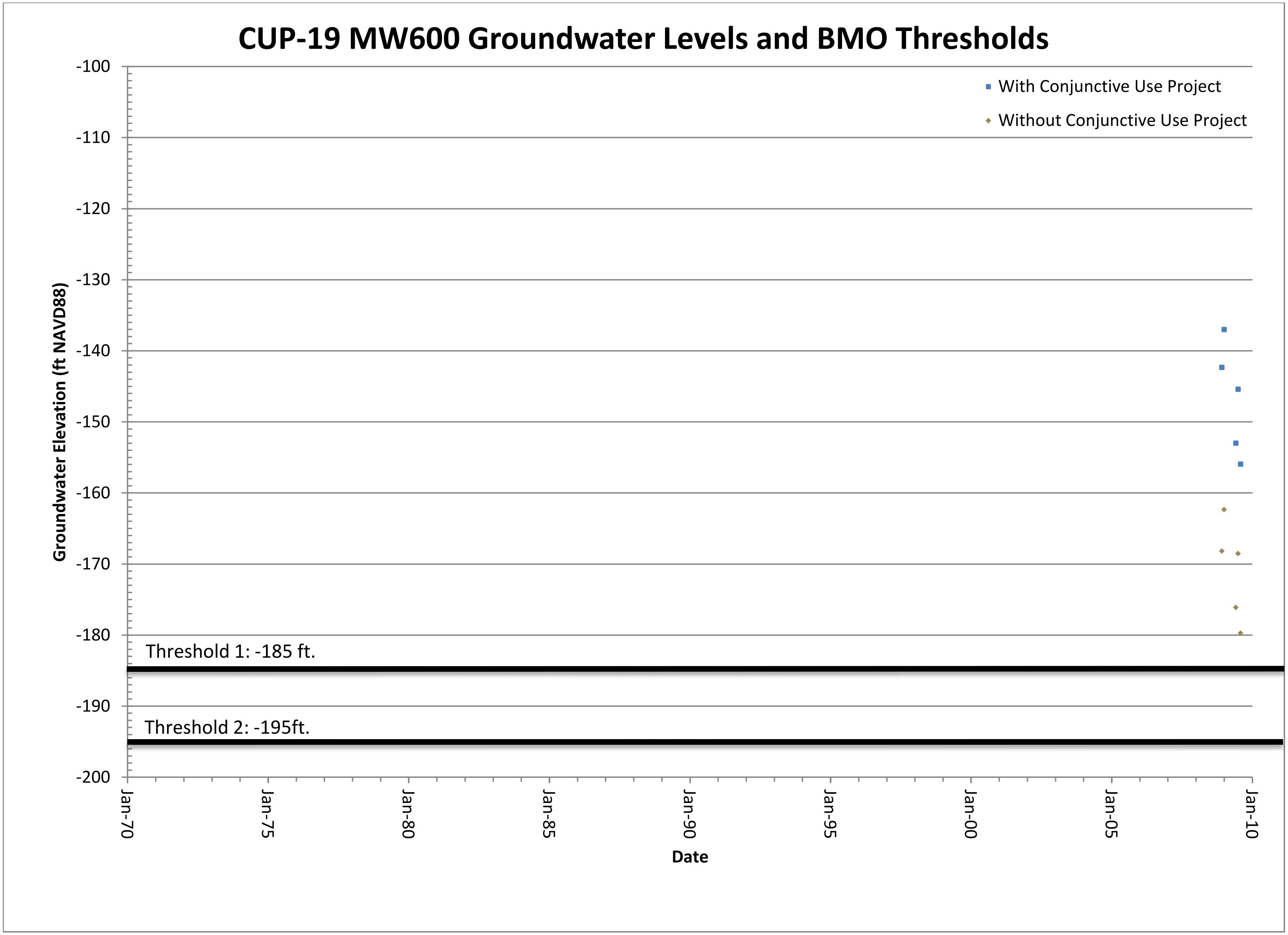

CUP-18 MW490 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Groundwater Elevation (ft NAVD88)
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
Threshold 1: -135 ft.
Threshold 2: -145ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



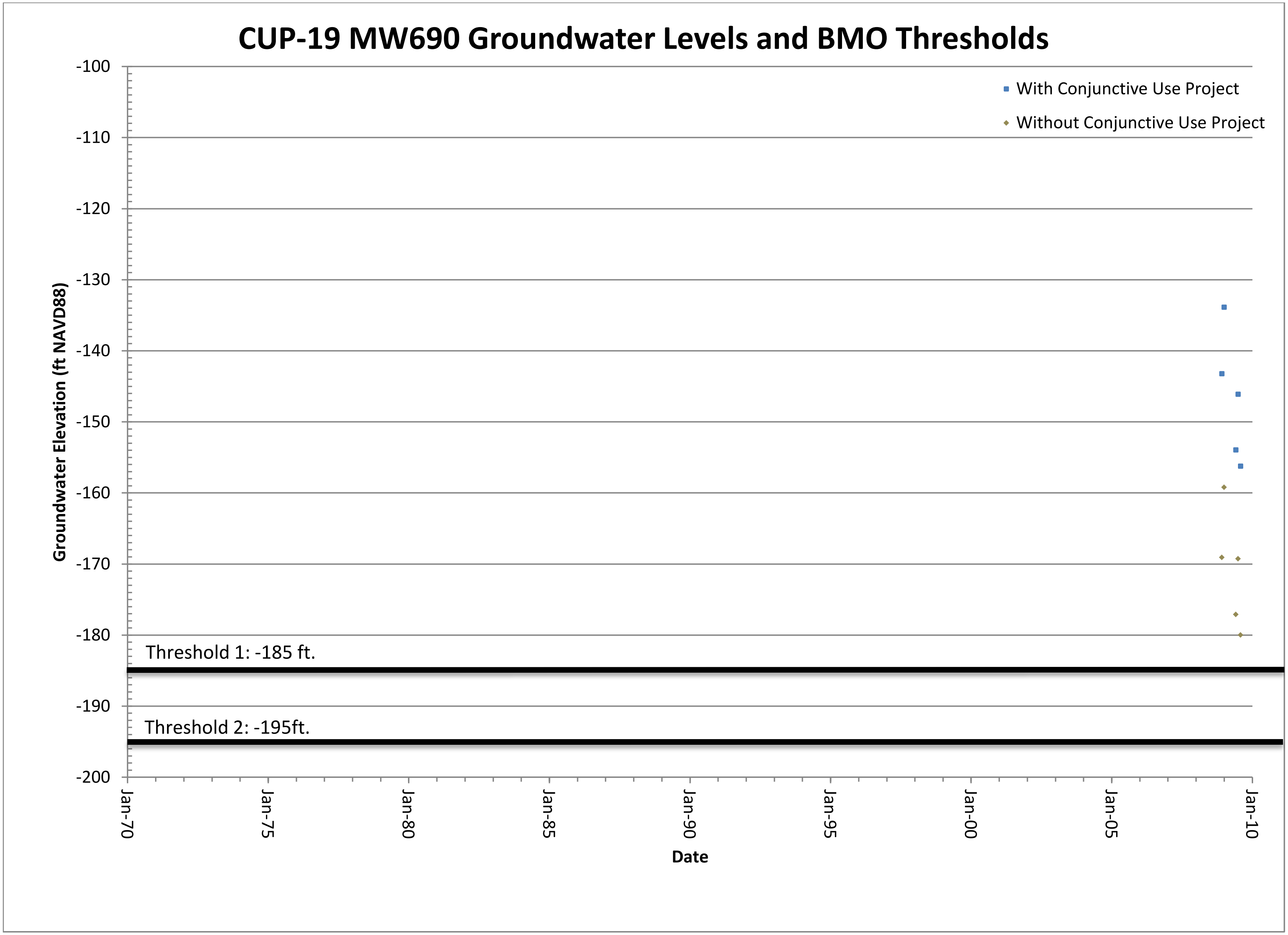
CUP-18 MW660 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Threshold 1: -180 ft.
Threshold 2: -190ft.
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

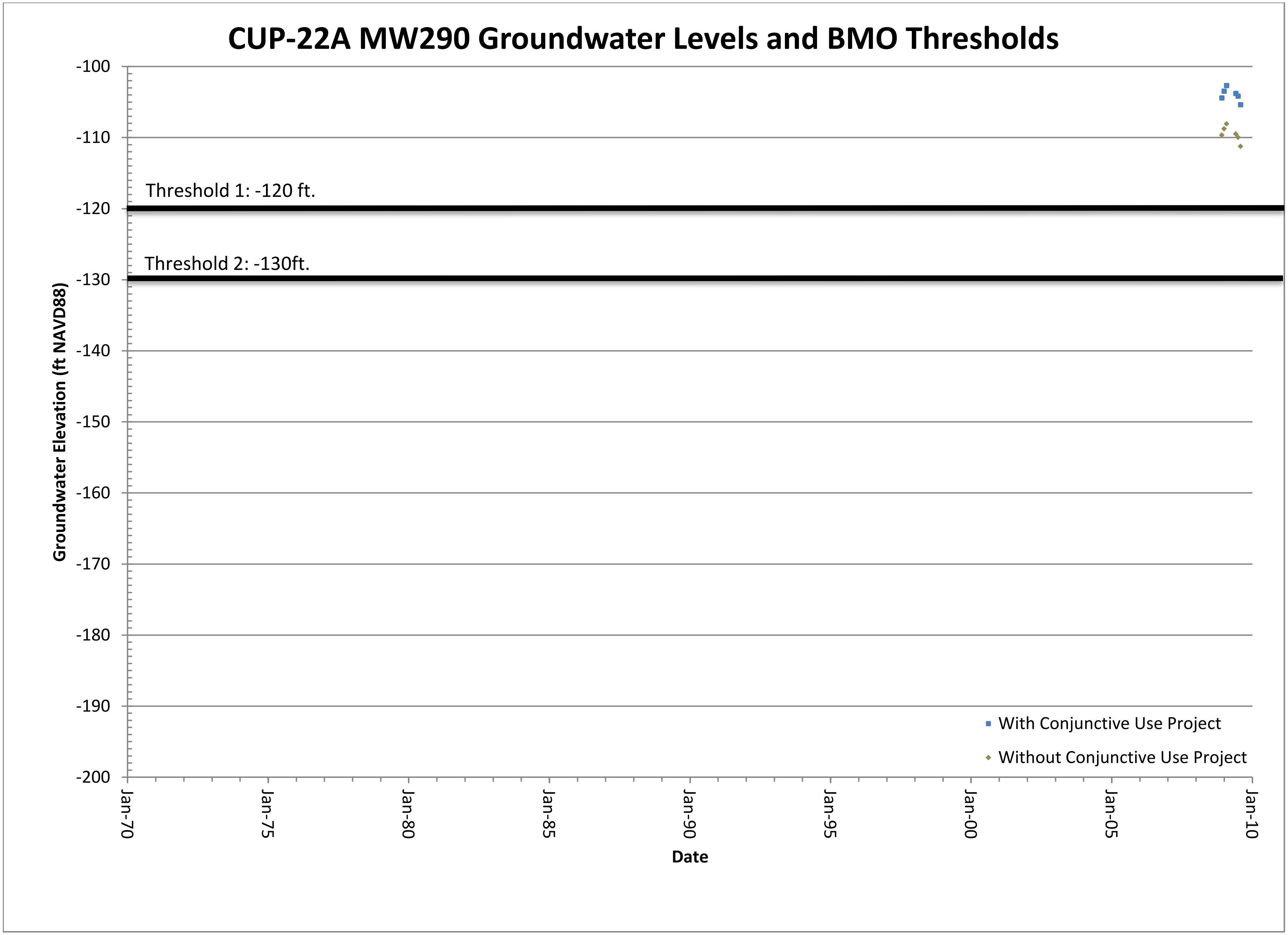


CUP-19 MW475 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Threshold 1: -150 ft.
Threshold 2: -160ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

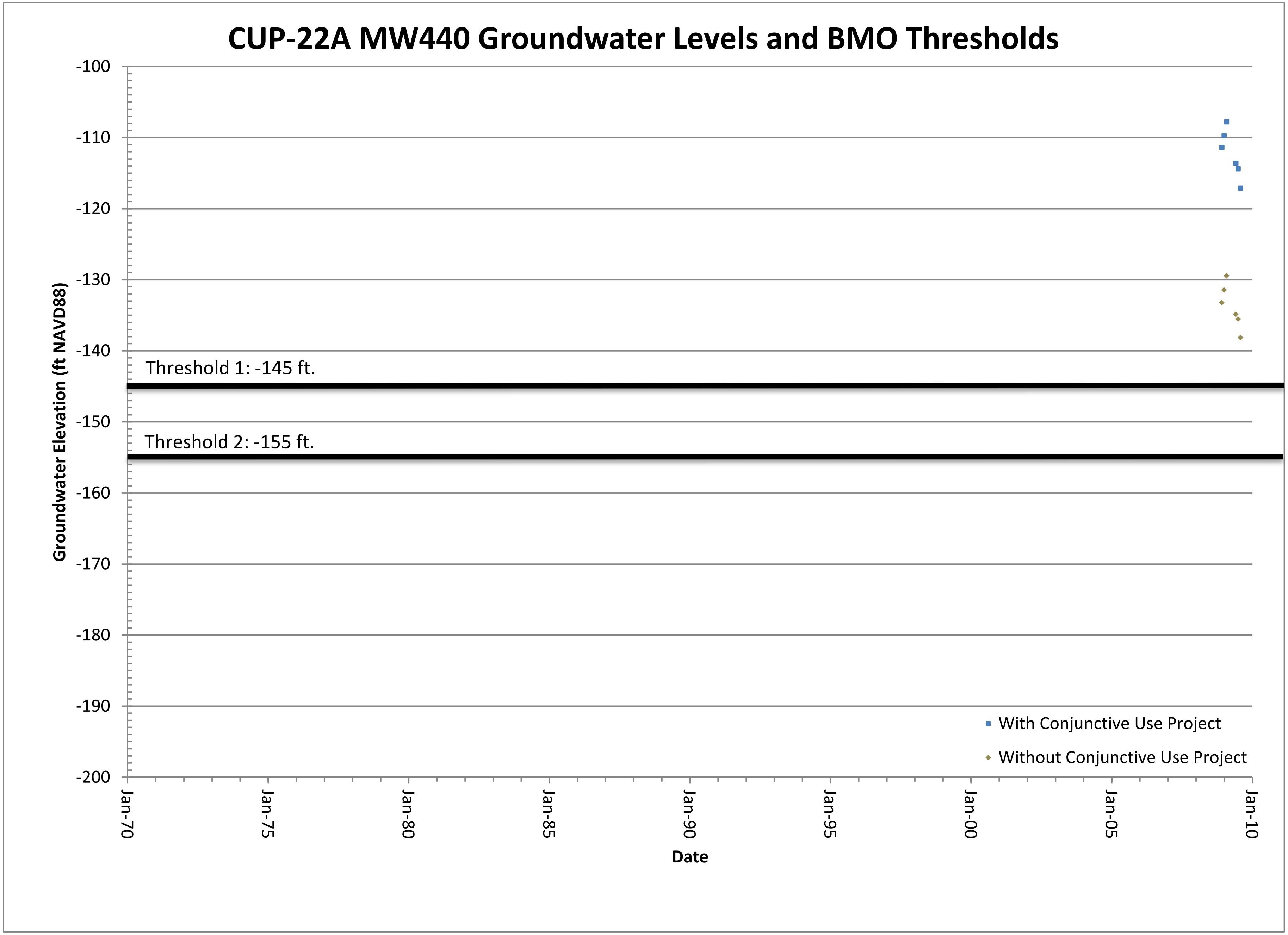


CUP-19 MW600 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Threshold 1: -185 ft.
Threshold 2: -195ft.
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


CUP-19 MW690 Groundwater Levels and BMO Thresholds
With Conjunctive Use Project
Without Conjunctive Use Project
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Threshold 1: -185 ft.
Threshold 2: -195ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

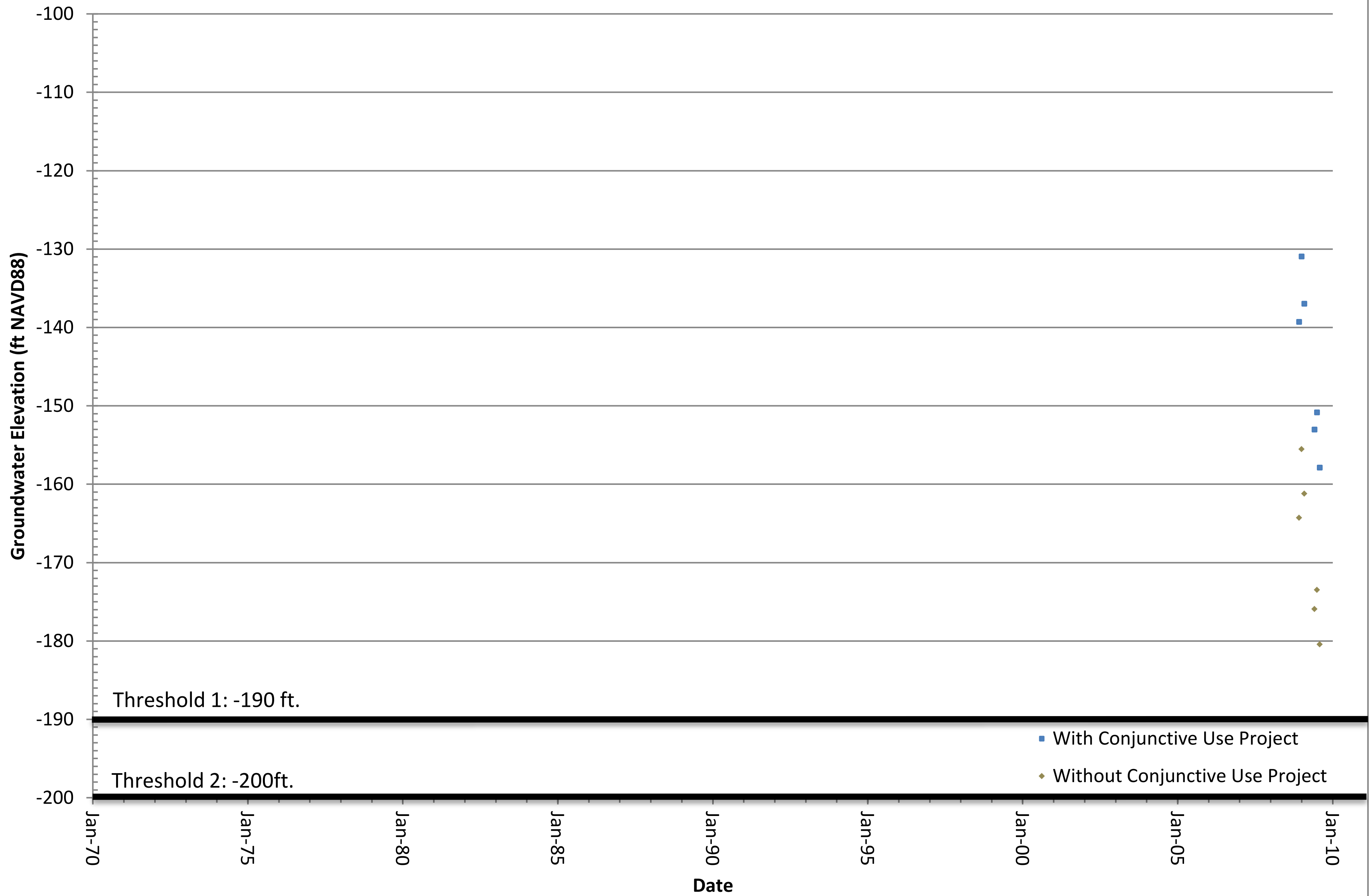


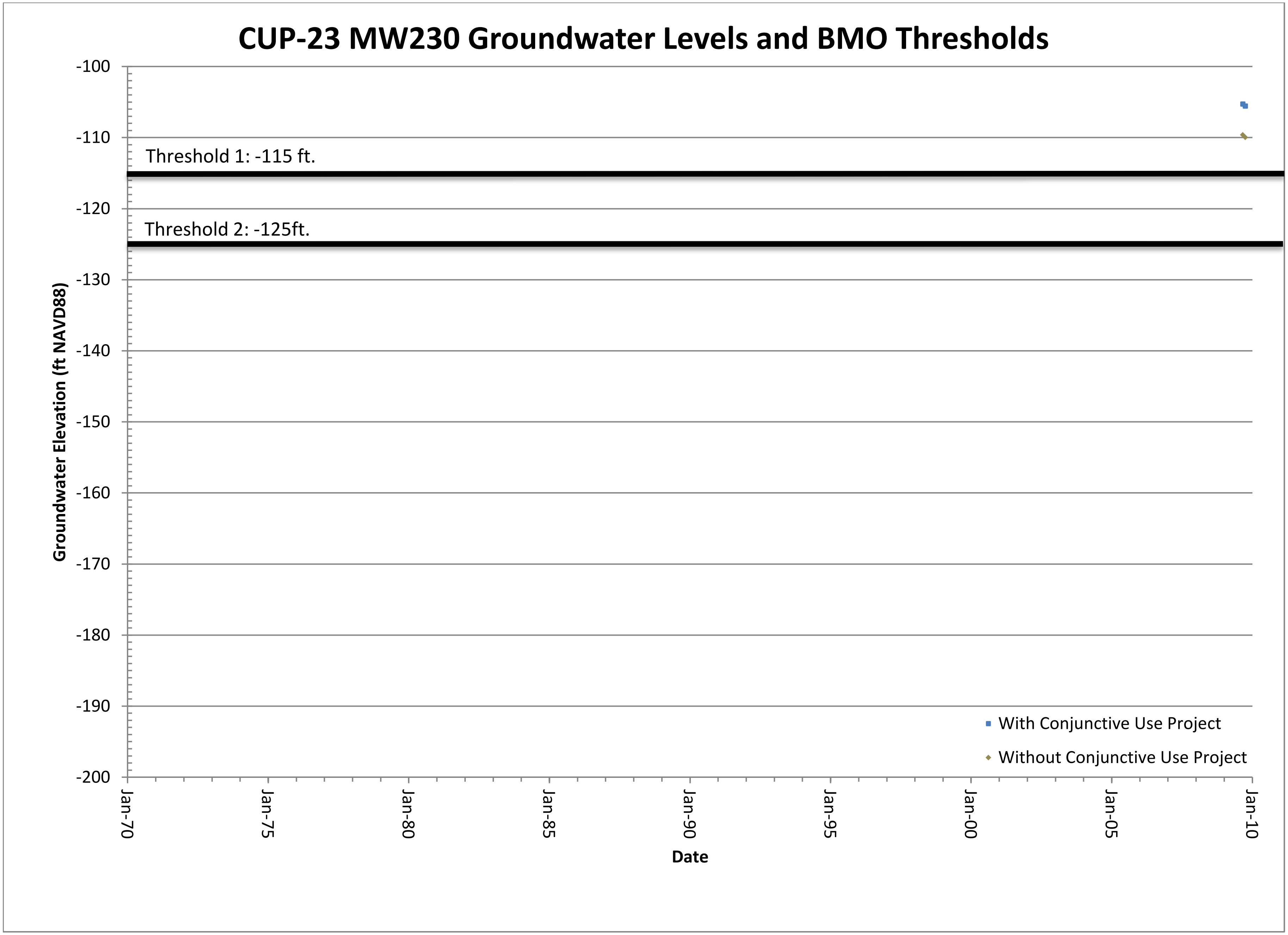
CUP-22A MW290 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Threshold 1: -120 ft.
Threshold 2: -130ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

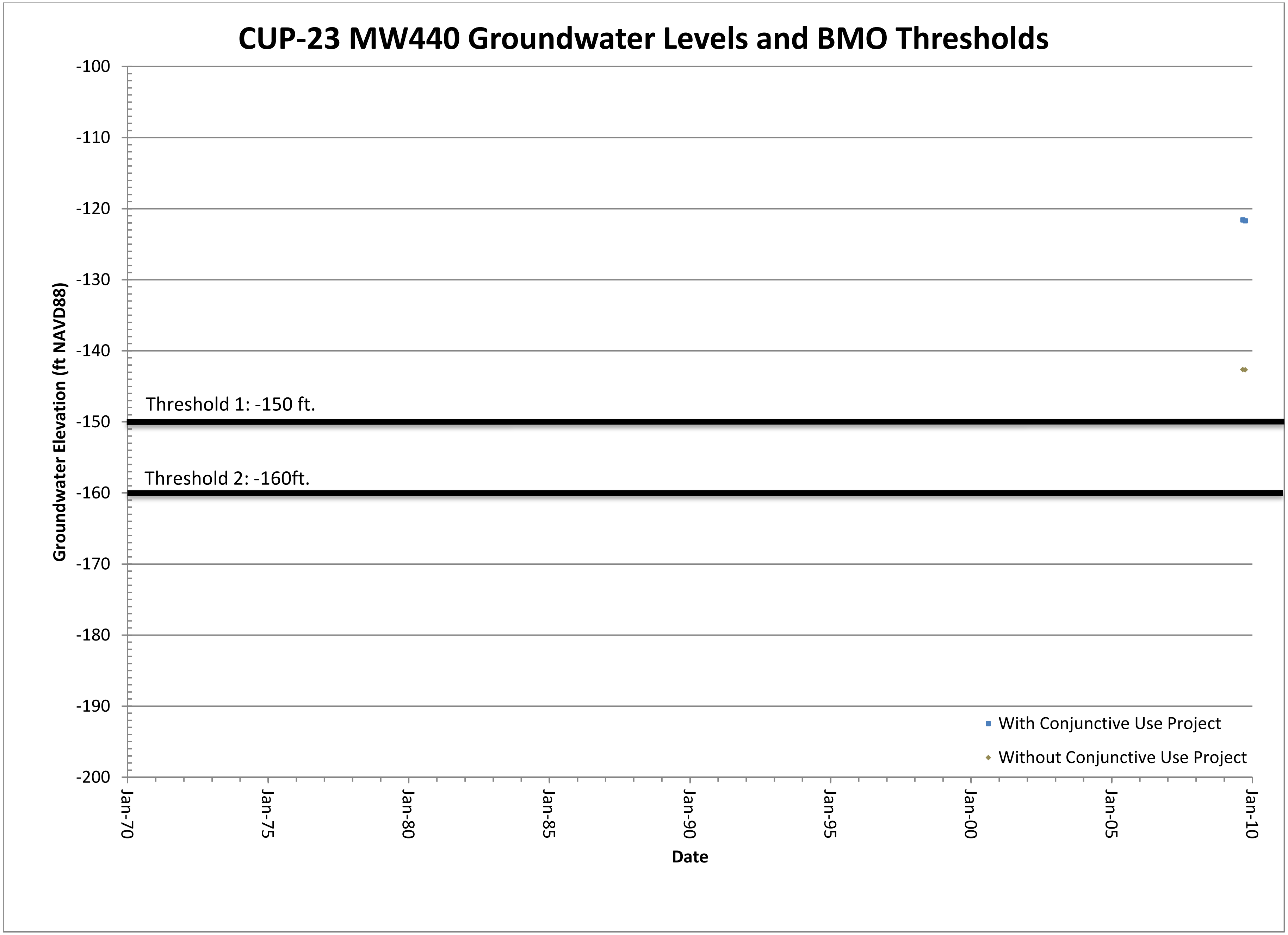


CUP-22A MW440 Groundwater Levels and BMO Thresholds
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Groundwater Elevation (ft NAVD88)
Threshold 1: -145 ft.
Threshold 2: -155 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

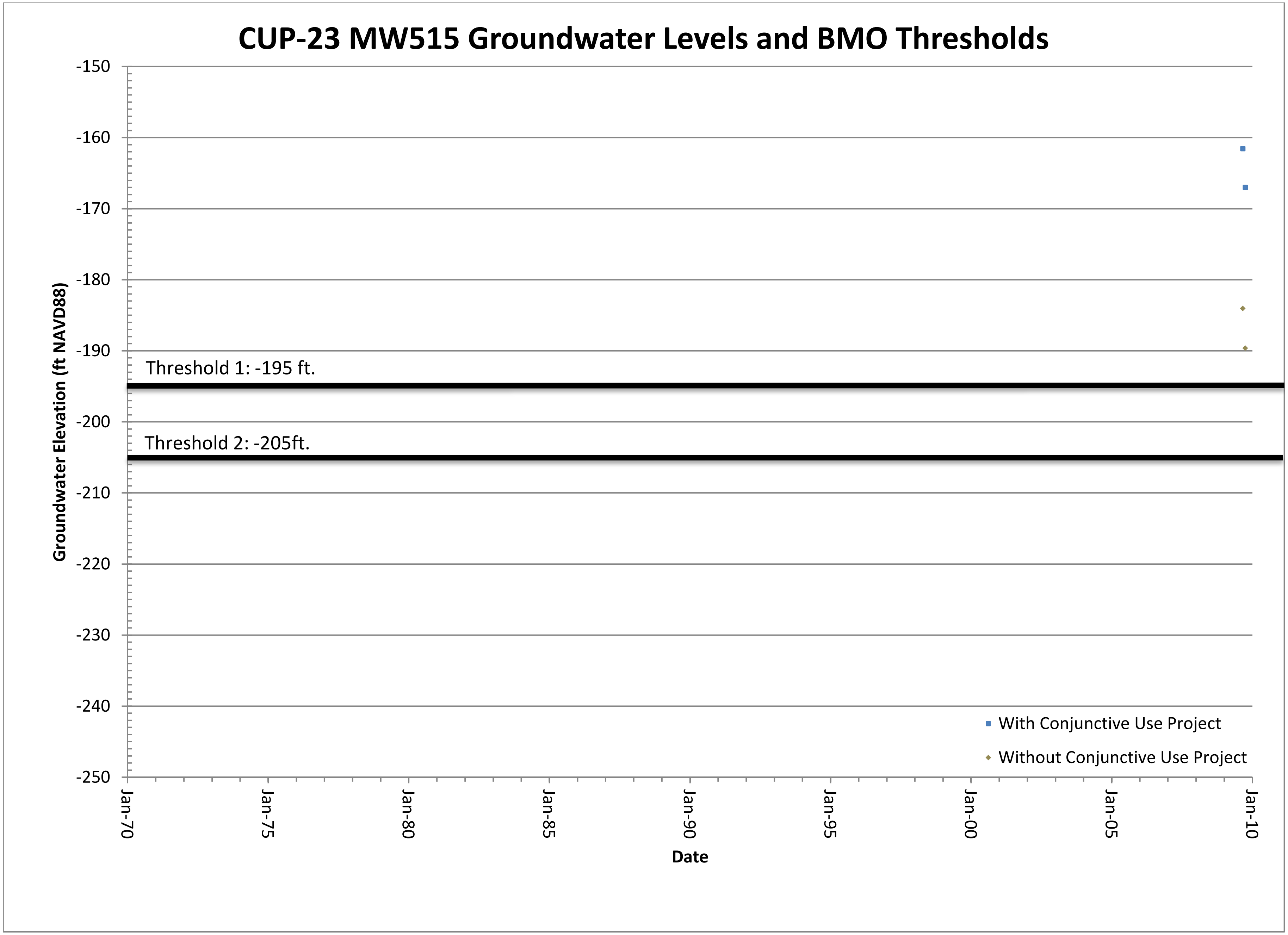
CUP-22A MW545 Groundwater Levels and BMO Thresholds

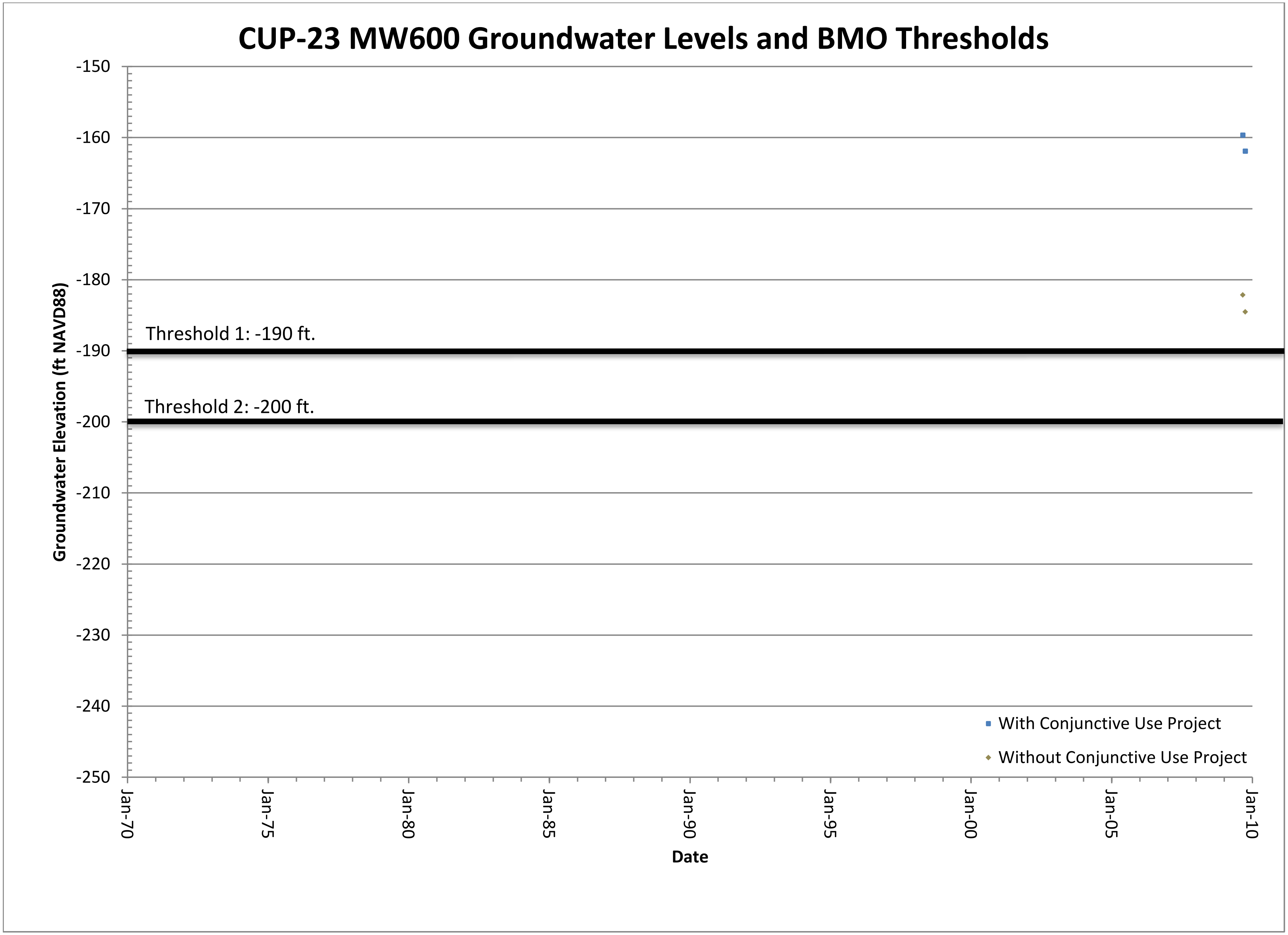


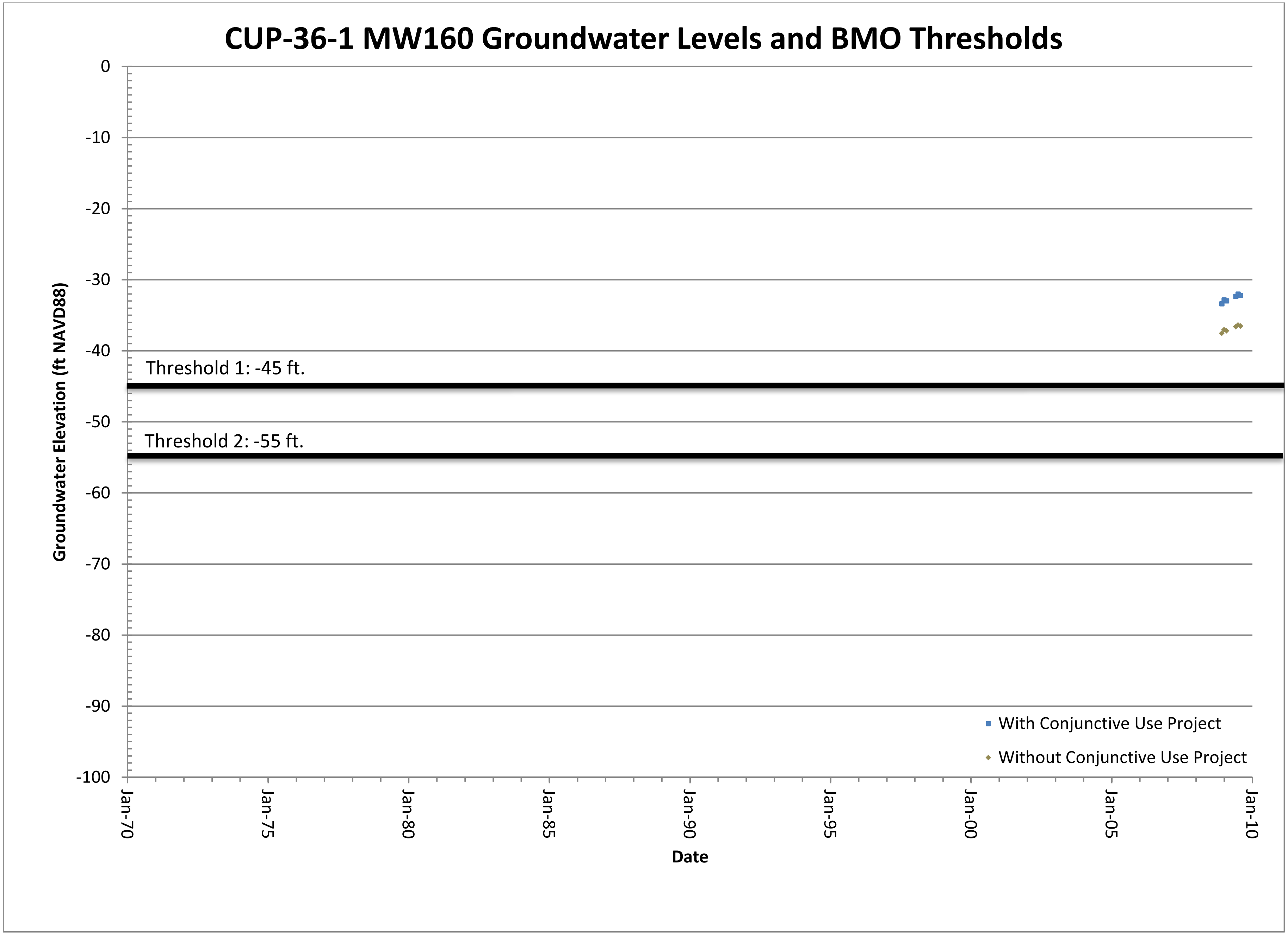

CUP-23 MW230 Groundwater Levels and BMO Thresholds
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Groundwater Elevation (ft NAVD88)
Threshold 1: -115 ft.
Threshold 2: -125ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

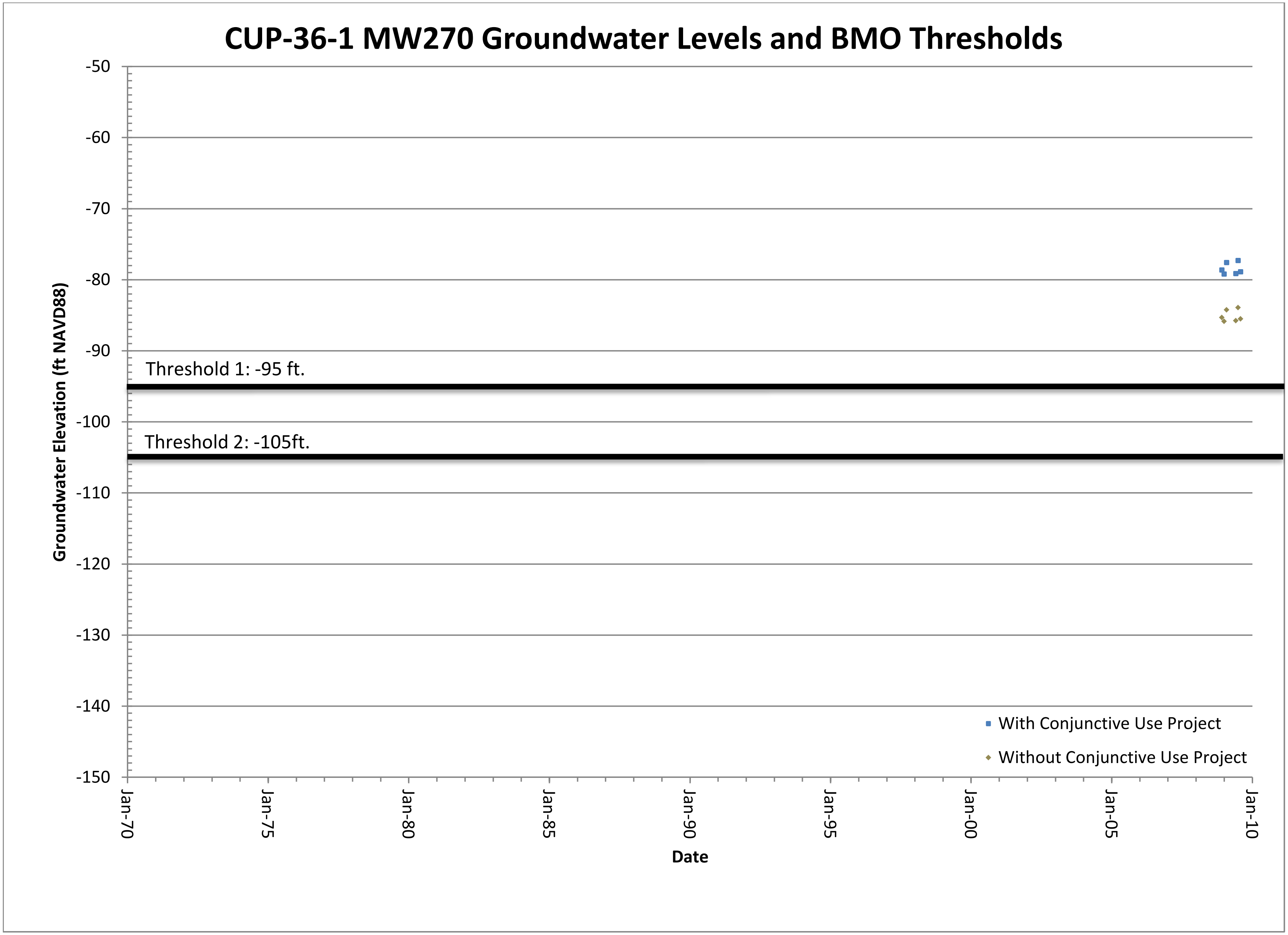


CUP-23 MW440 Groundwater Levels and BMO Thresholds
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
Groundwater Elevation (ft NAVD88)
Threshold 1: -150 ft.
Threshold 2: -160ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

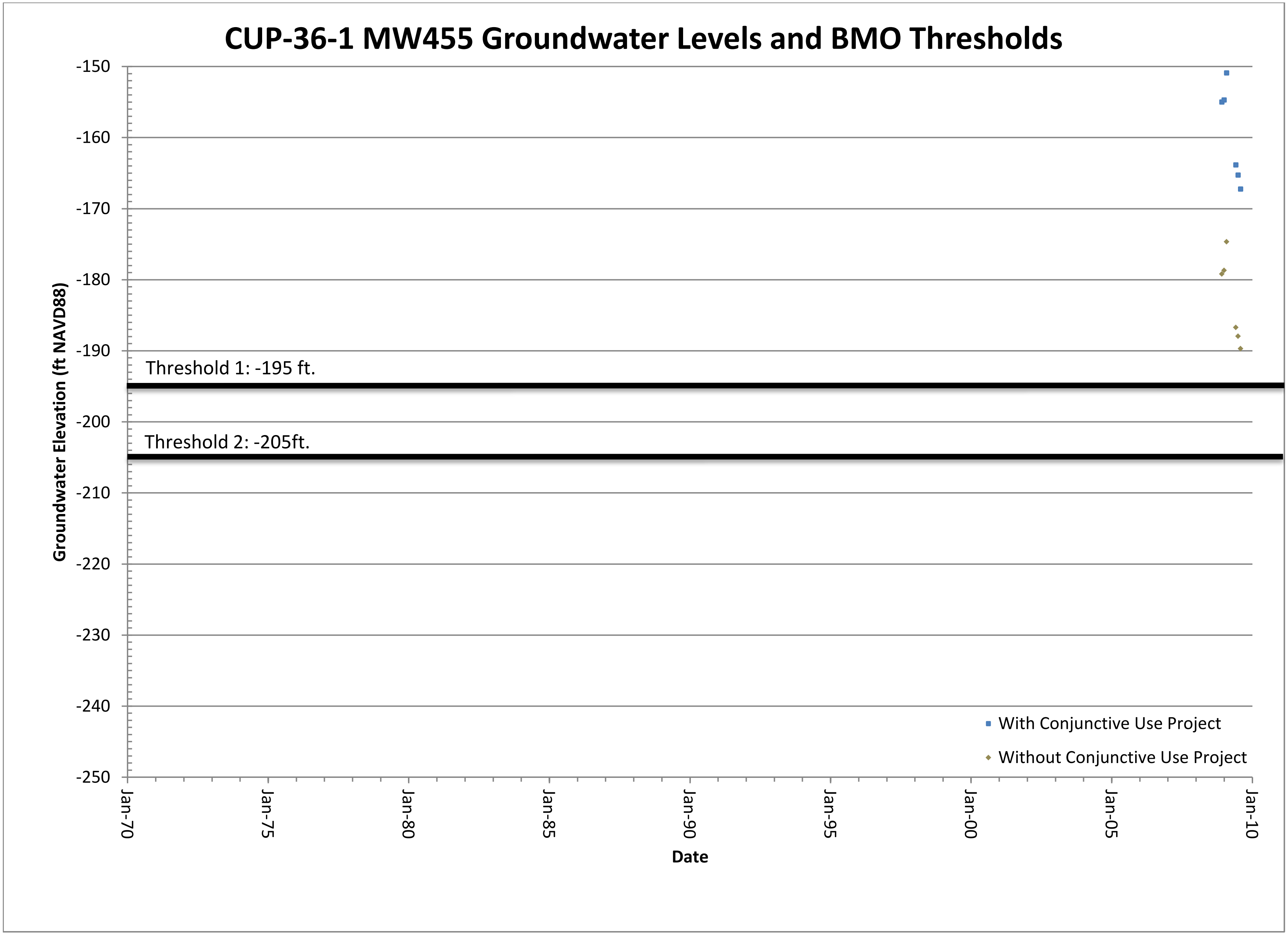

CUP-23 MW515 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -195 ft.
Threshold 2: -205ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


CUP-23 MW600 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -190 ft.
Threshold 2: -200 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

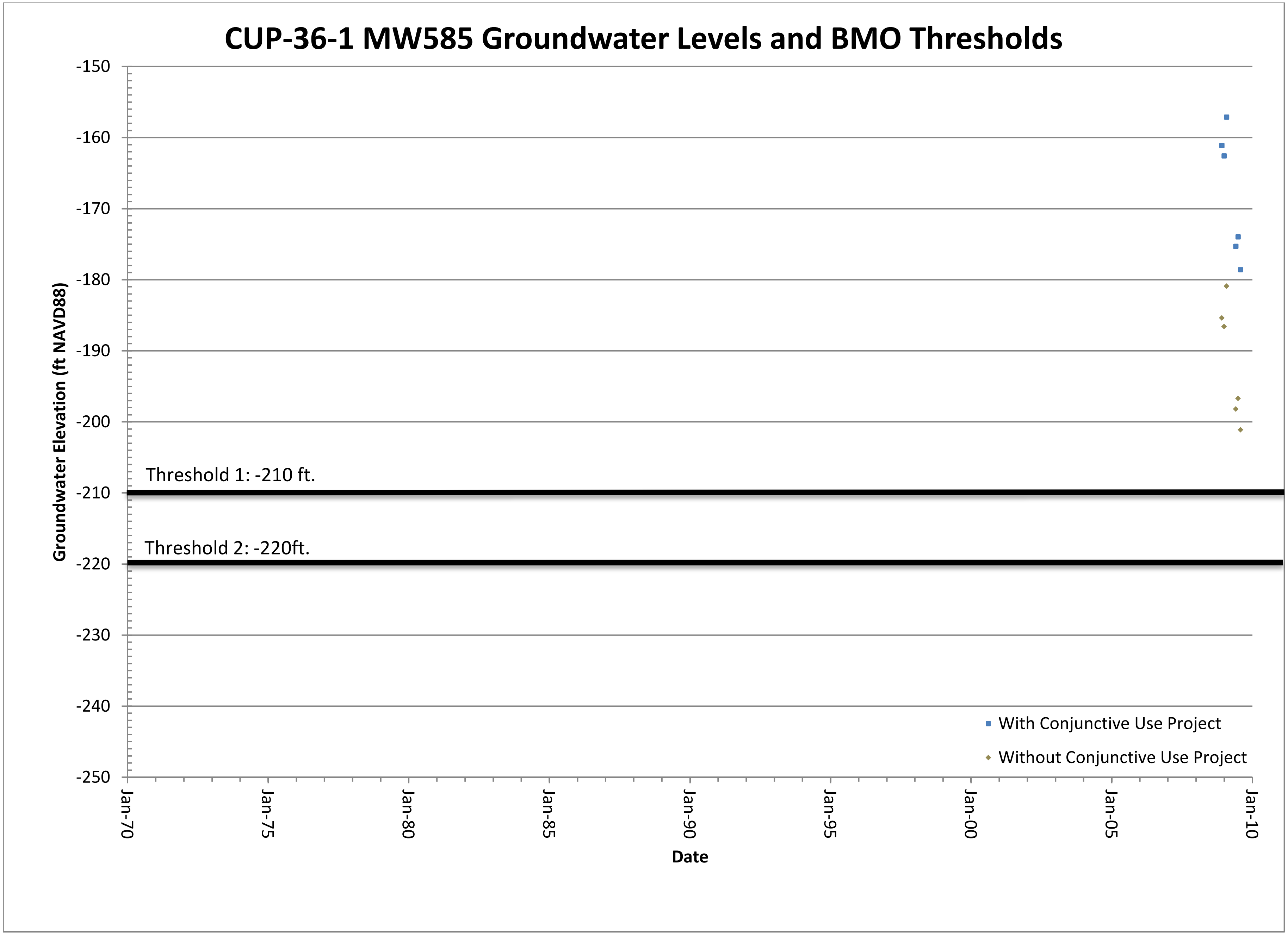

CUP-36-1 MW160 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Threshold 1: -45 ft.
Threshold 2: -55 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



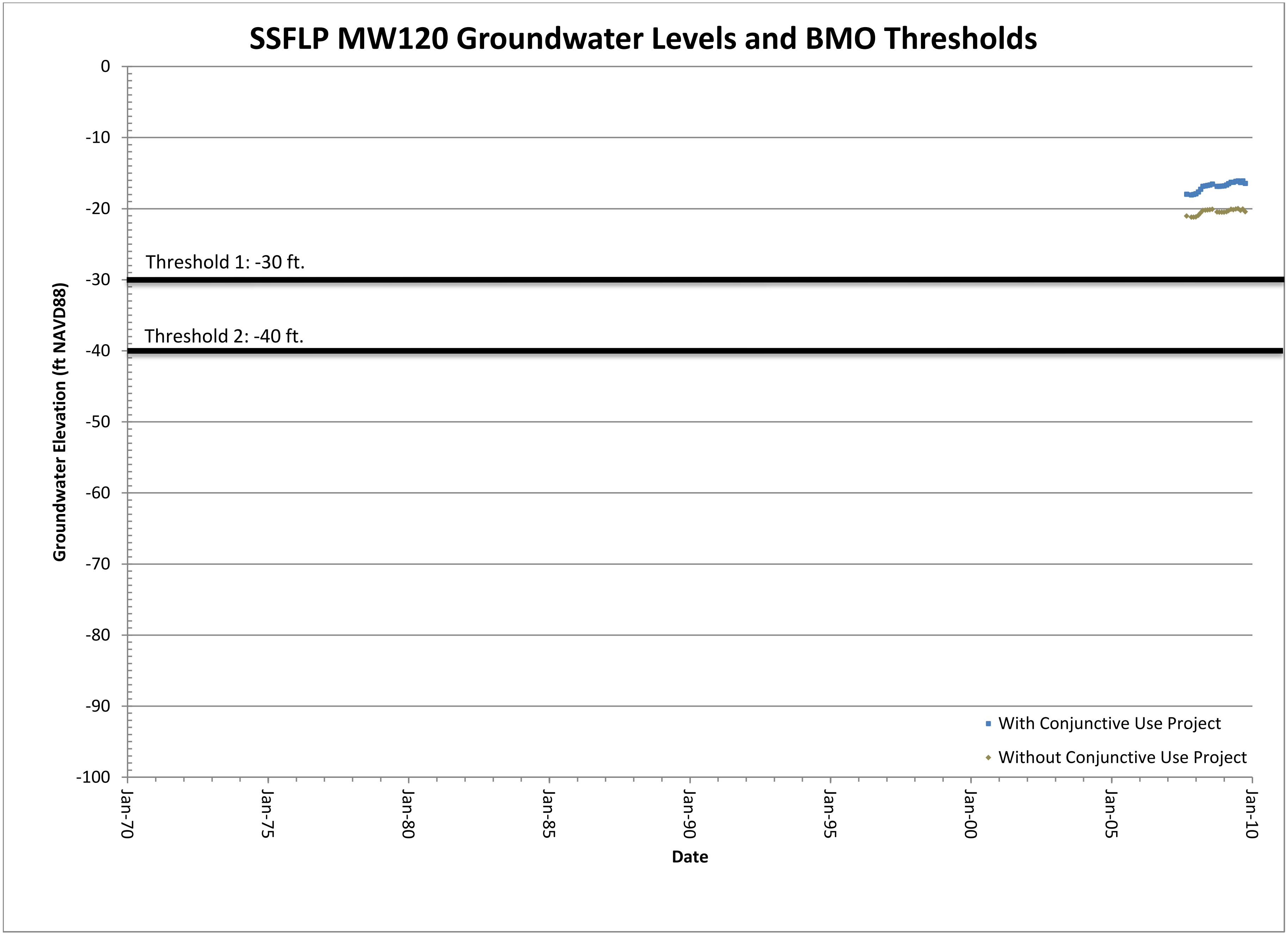
CUP-36-1 MW270 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
Threshold 1: -95 ft.
Threshold 2: -105ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

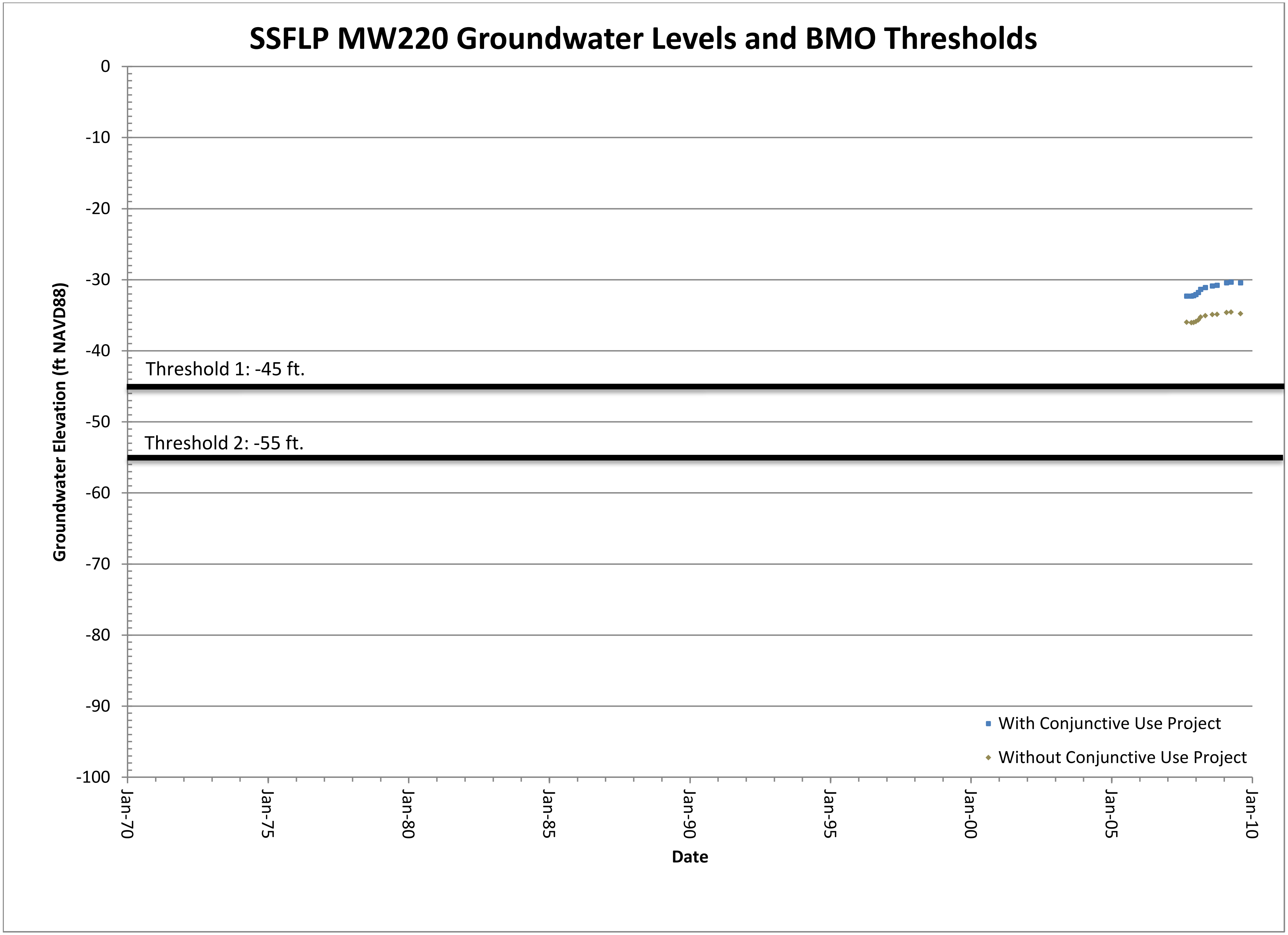


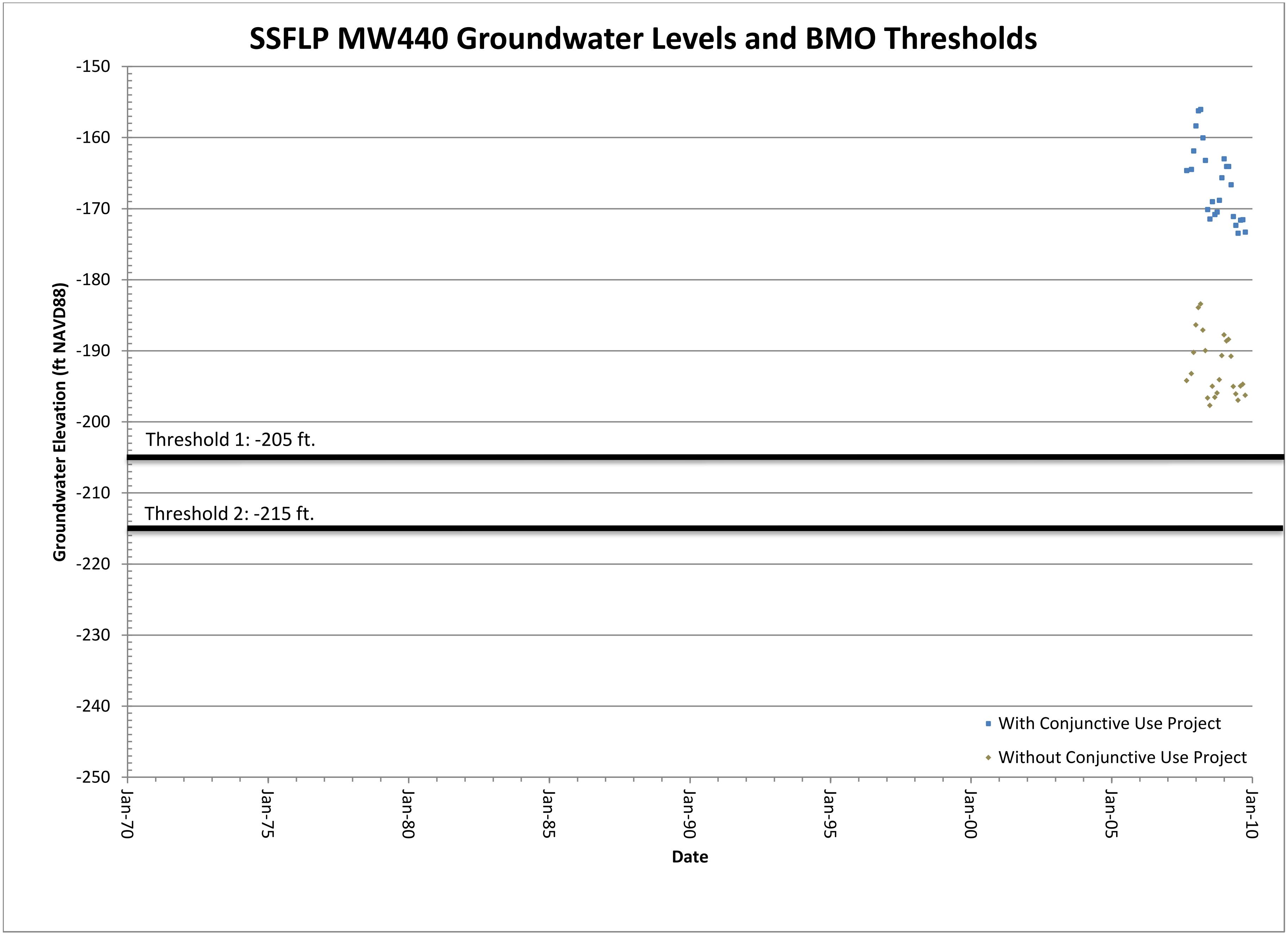
CUP-36-1 MW455 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -195 ft.
Threshold 2: -205ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

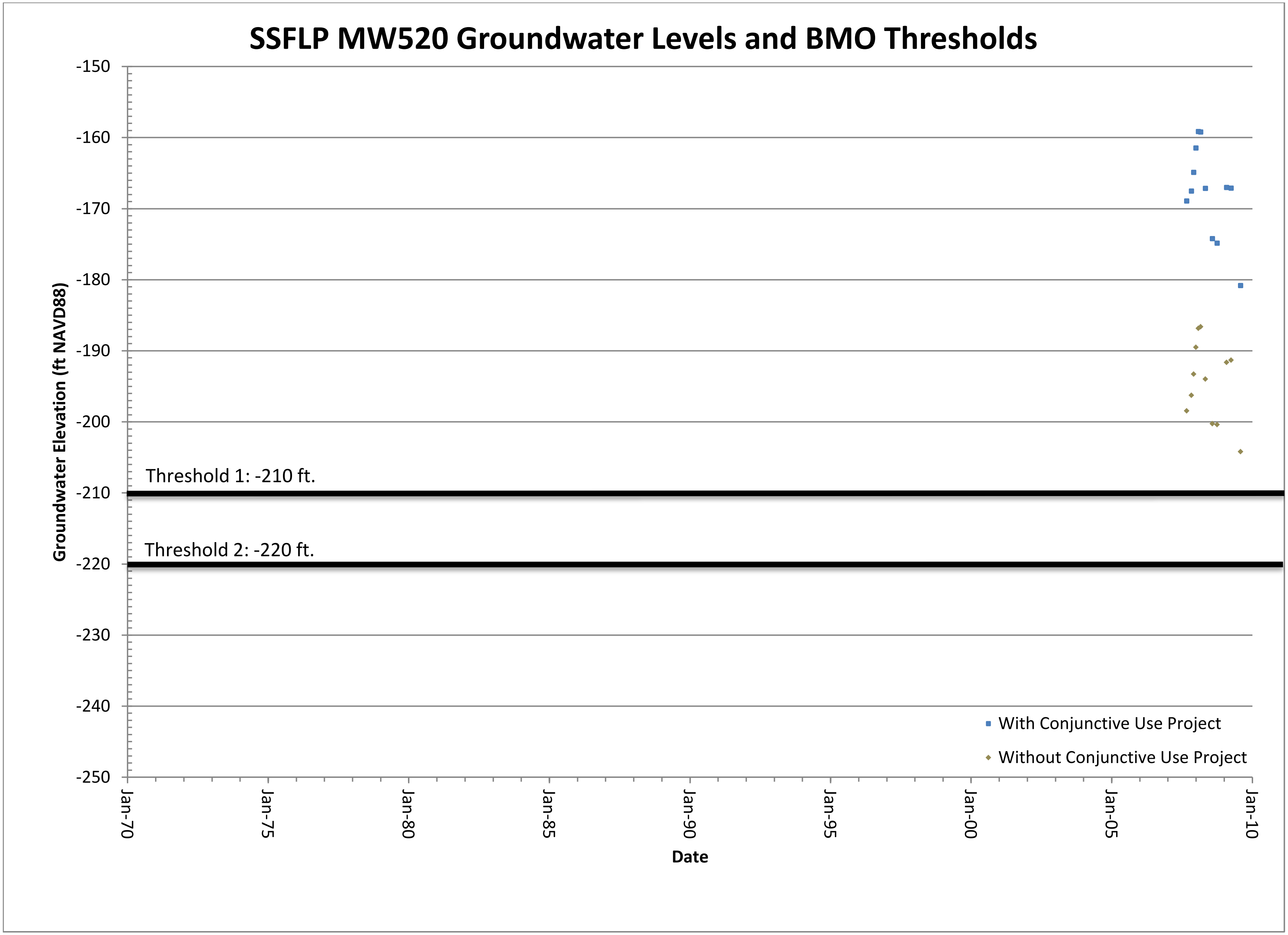


CUP-36-1 MW585 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -210 ft.
Threshold 2: -220ft.
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date
With Conjunctive Use Project
Without Conjunctive Use Project

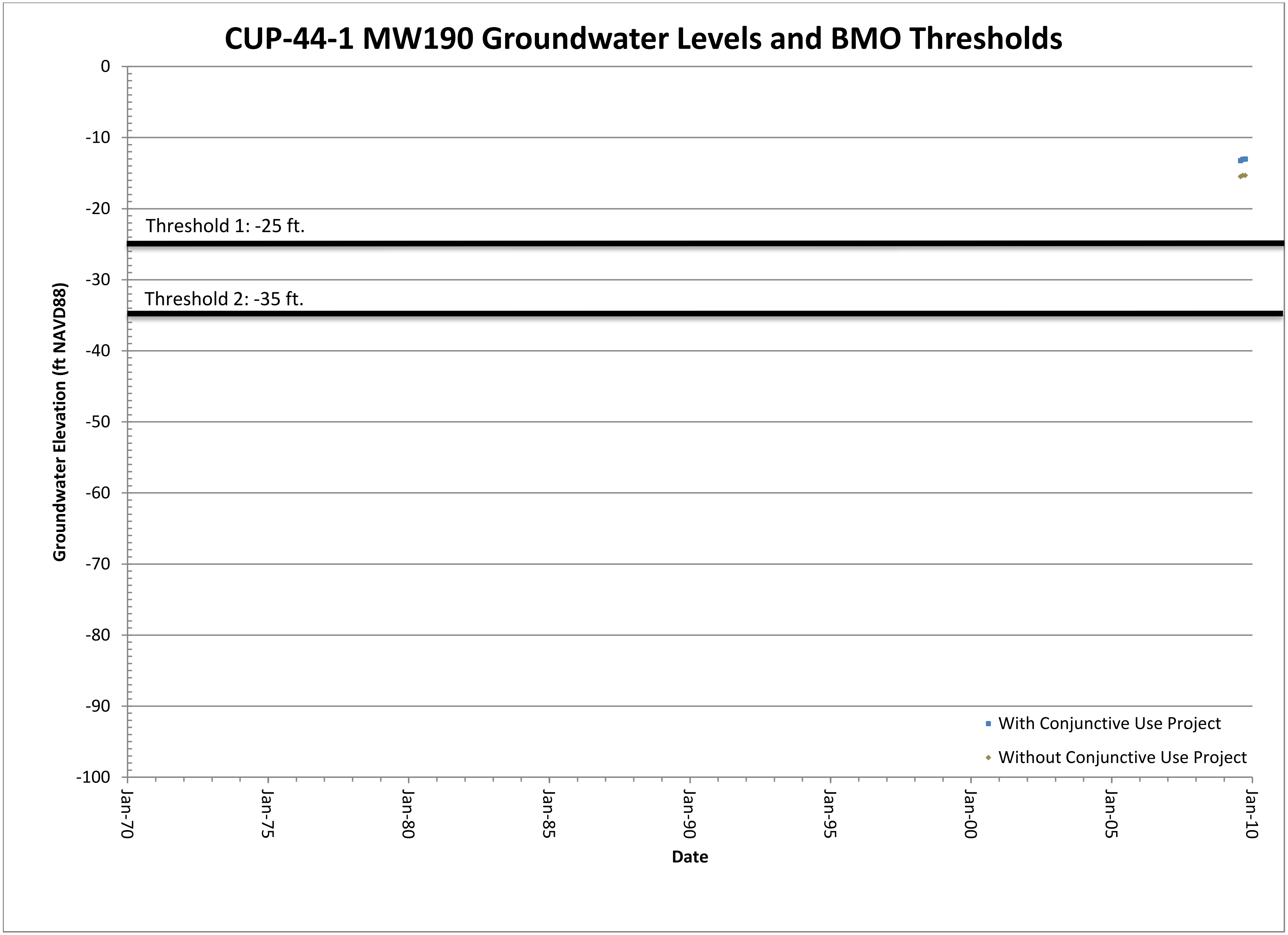

SSFLP MW120 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Threshold 1: -30 ft.
Threshold 2: -40 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date


SSFLP MW220 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Threshold 1: -45 ft.
Threshold 2: -55 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

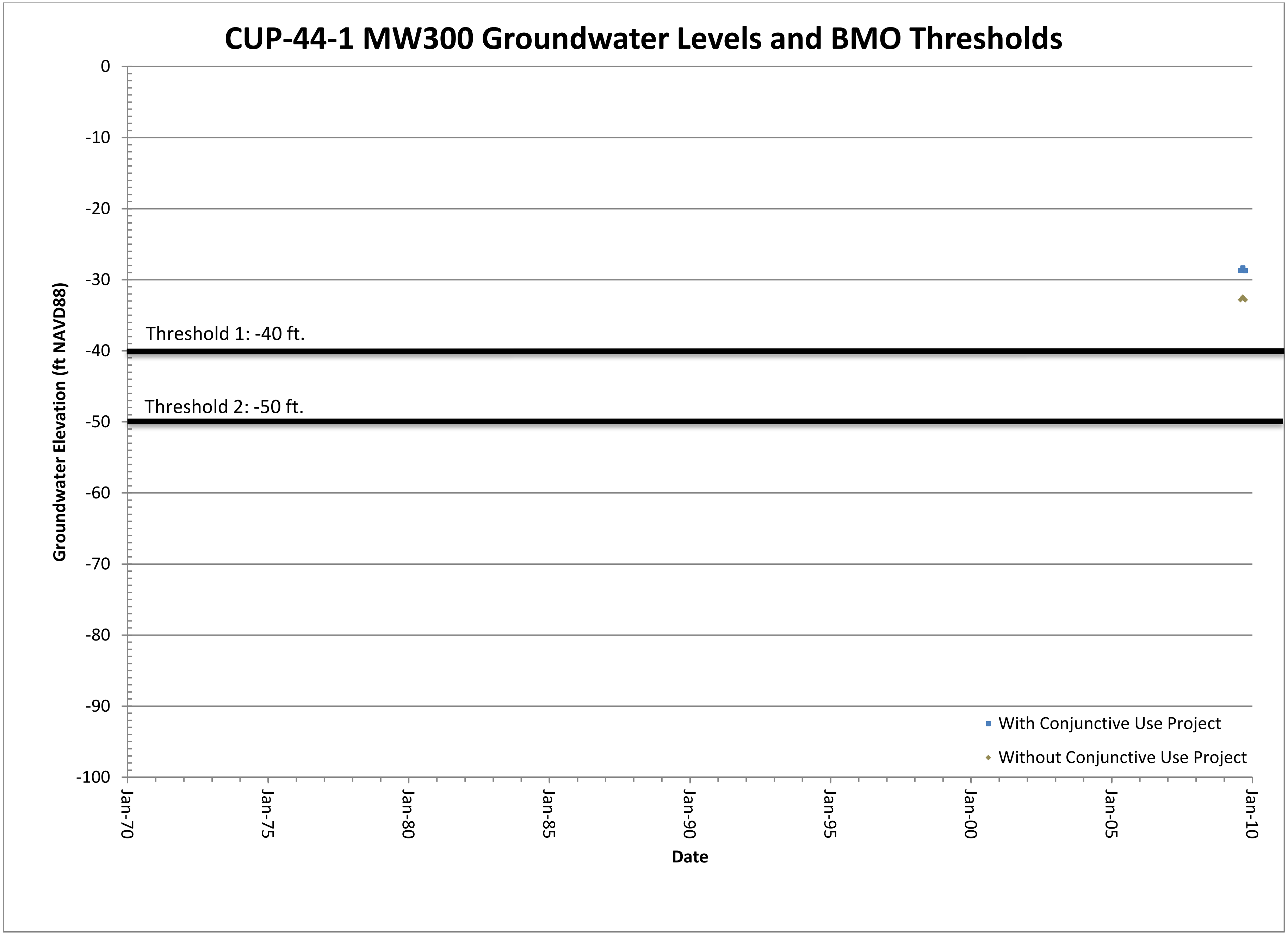

SSFLP MW440 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -205 ft.
Threshold 2: -215 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



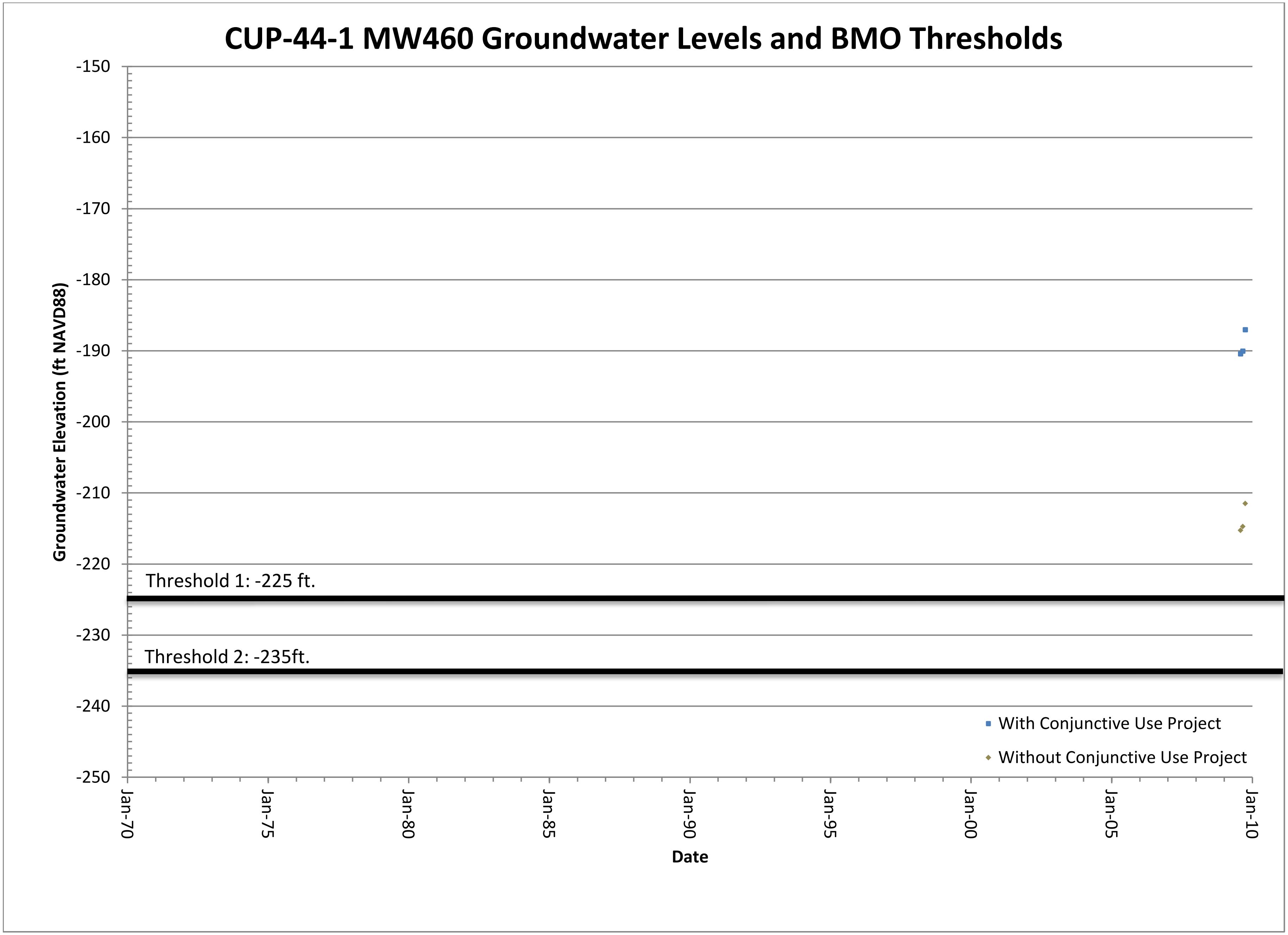
SSFLP MW520 Groundwater Levels and BMO Thresholds
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Groundwater Elevation (ft NAVD88)
Threshold 1: -210 ft.
Threshold 2: -220 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

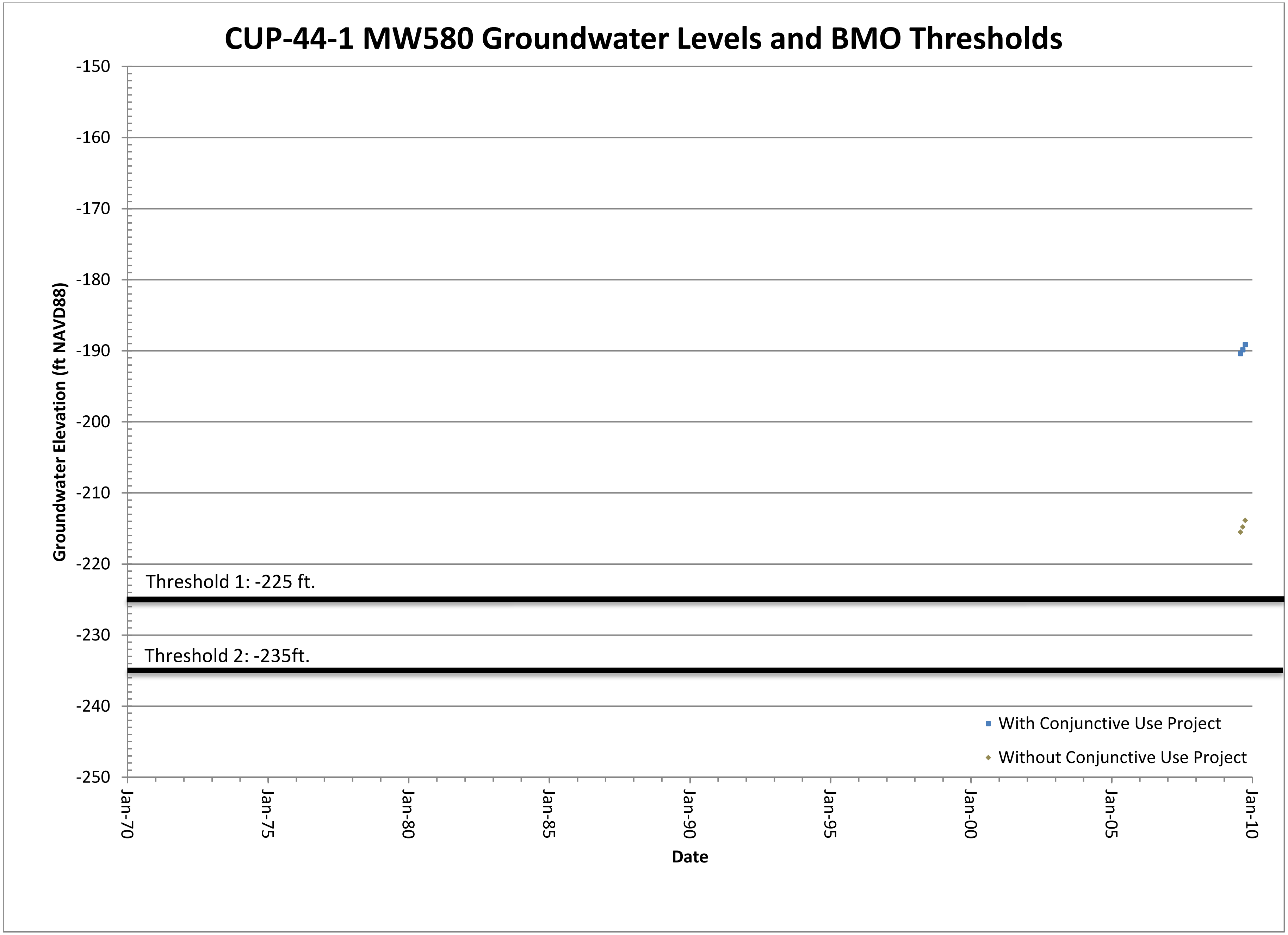


CUP-44-1 MW190 Groundwater Levels and BMO Thresholds
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Groundwater Elevation (ft NAVD88)
Threshold 1: -25 ft.
Threshold 2: -35 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date



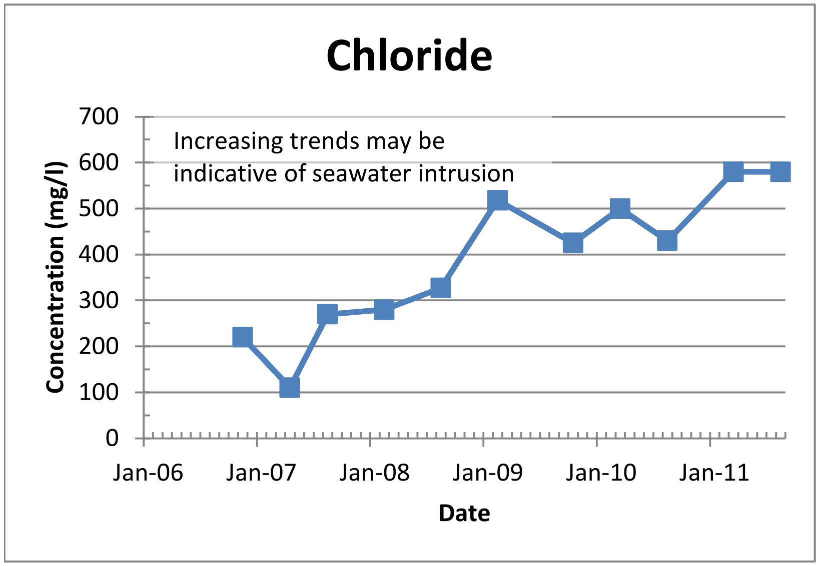
CUP-44-1 MW300 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Threshold 1: -40 ft.
Threshold 2: -50 ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

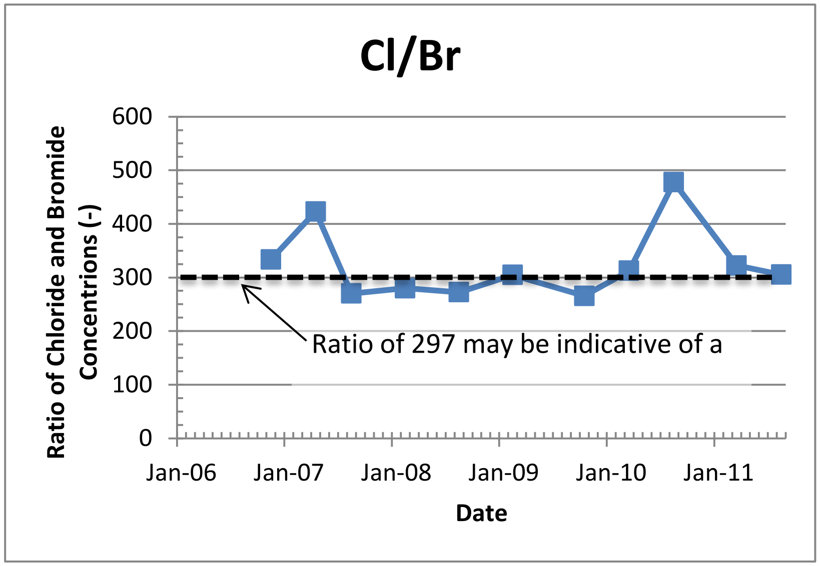

CUP-44-1 MW460 Groundwater Levels and BMO Thresholds
Groundwater Elevation (ft NAVD88)
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Threshold 1: -225 ft.
Threshold 2: -235ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

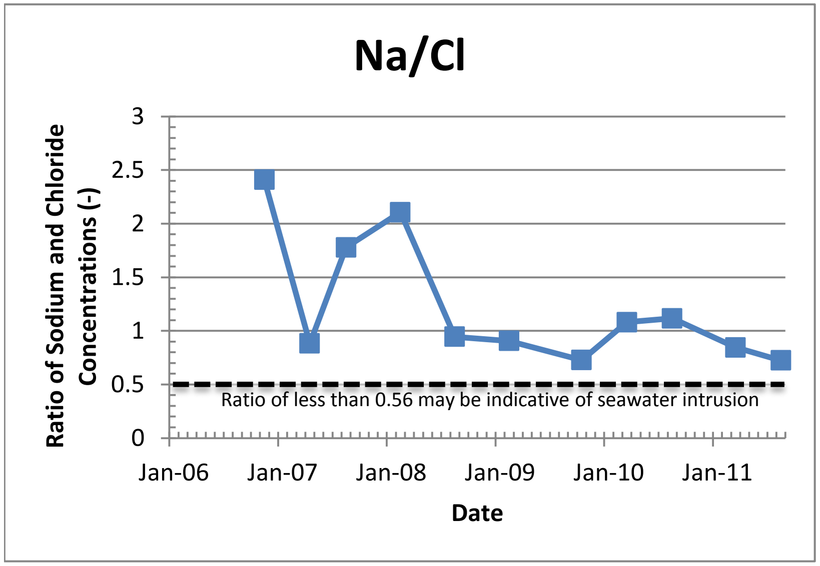

CUP-44-1 MW580 Groundwater Levels and BMO Thresholds
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
Groundwater Elevation (ft NAVD88)
Threshold 1: -225 ft.
Threshold 2: -235ft.
With Conjunctive Use Project
Without Conjunctive Use Project
Jan-70
Jan-75
Jan-80
Jan-85
Jan-90
Jan-95
Jan-00
Jan-05
Jan-10
Date

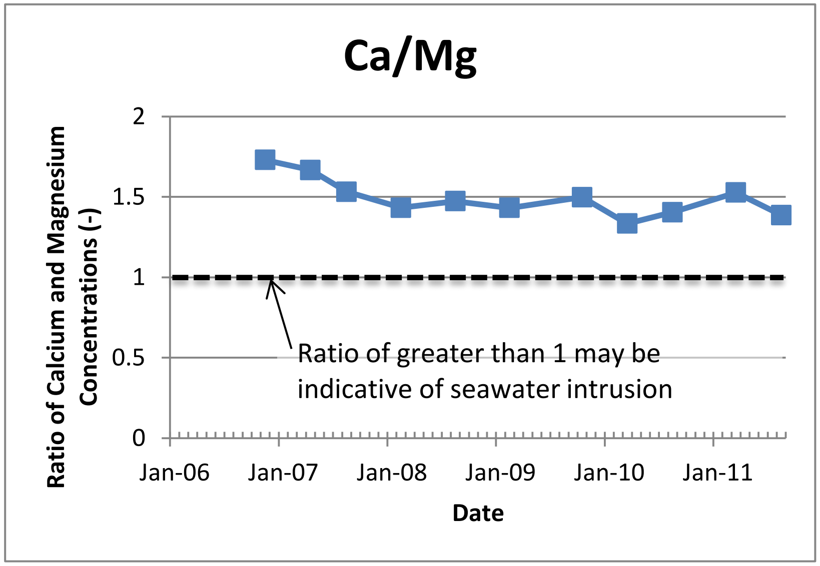
APPENDIX E – SEAWATER INTRUSION INDICATORS

Seawater Intrusion Indicators for Well Burlingame-S

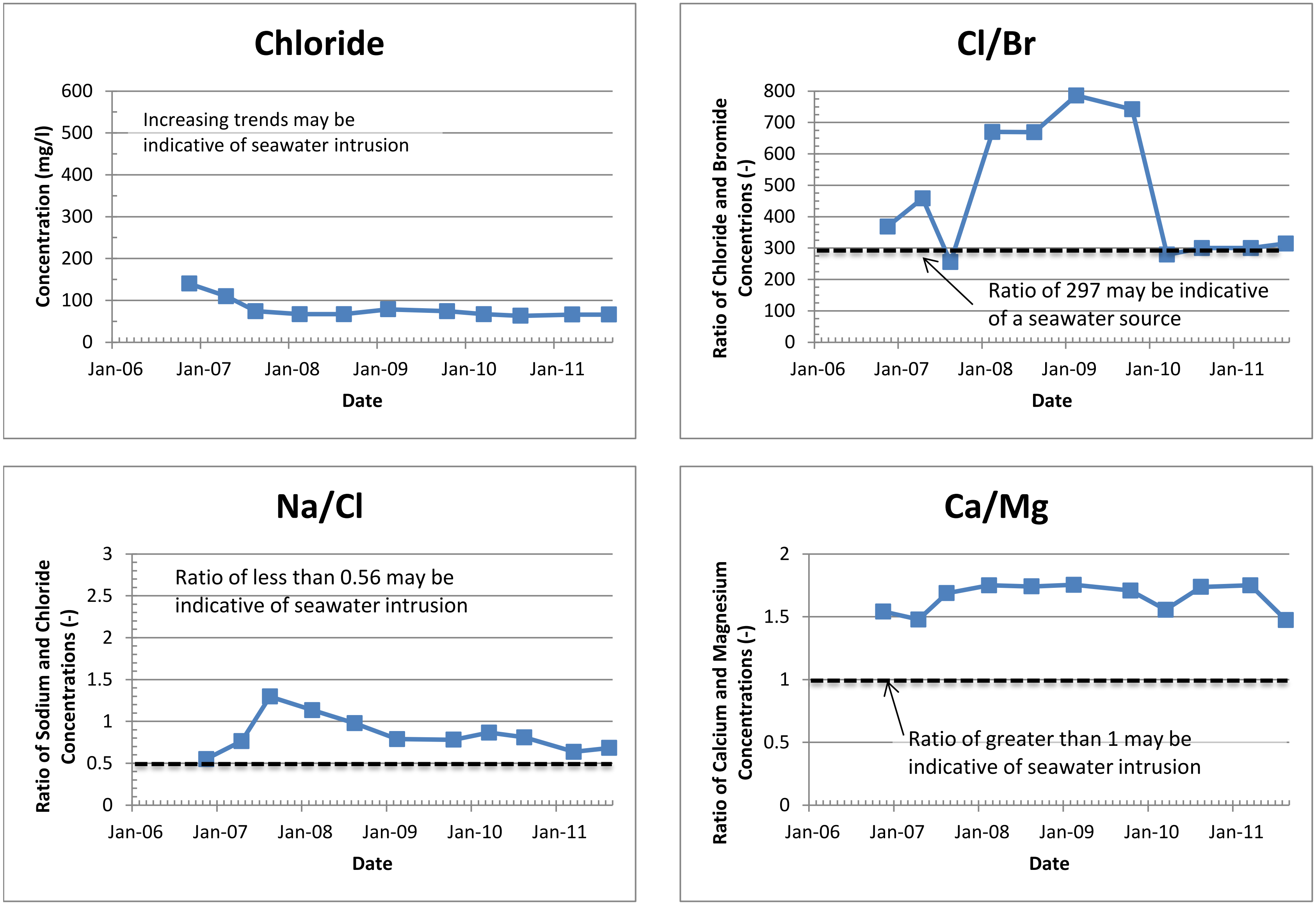




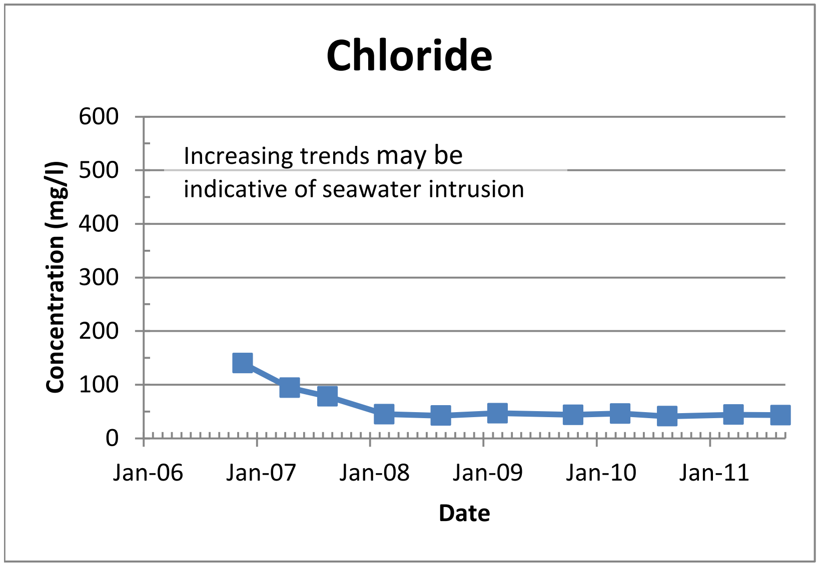


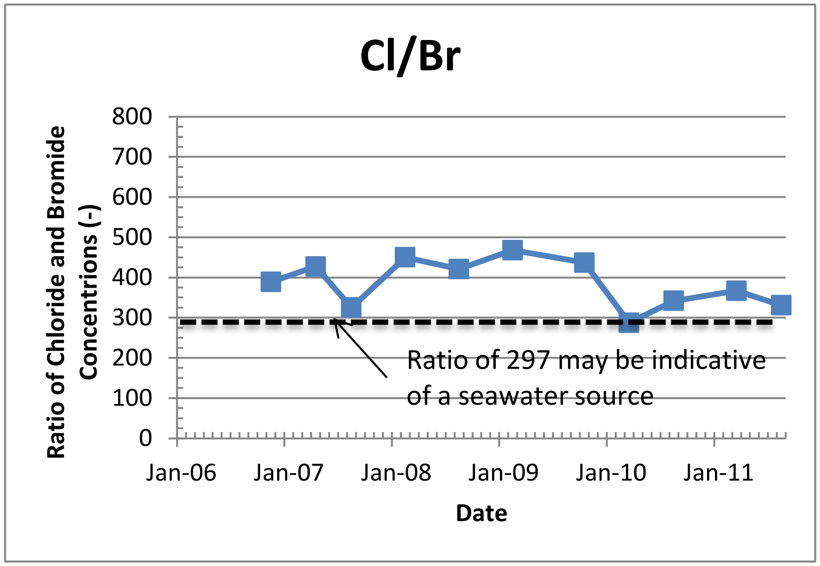


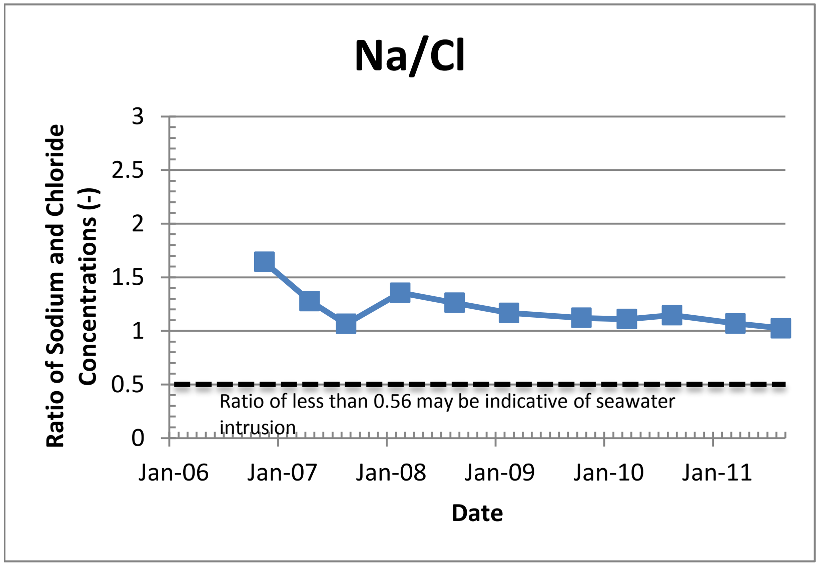
Seawater Intrusion Indicators for Well Burlingame-M

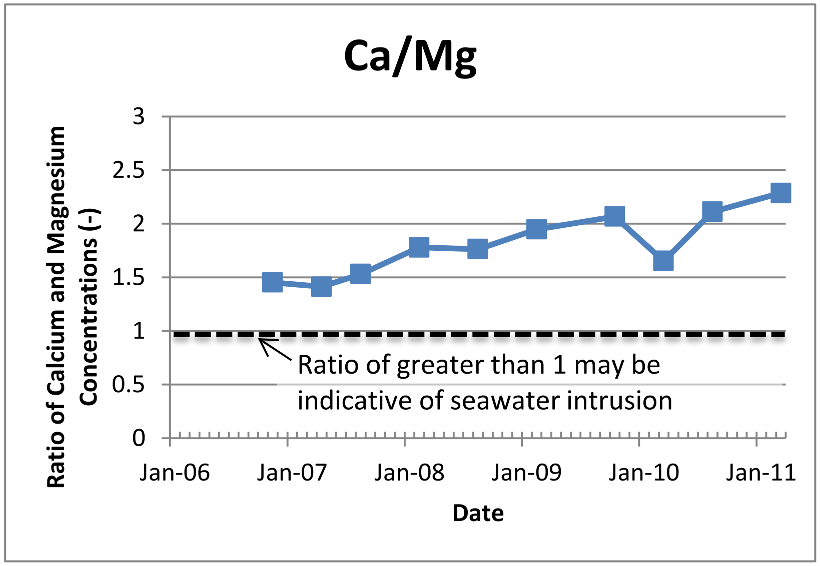


Seawater Intrusion Indicators for Well Burlingame-D

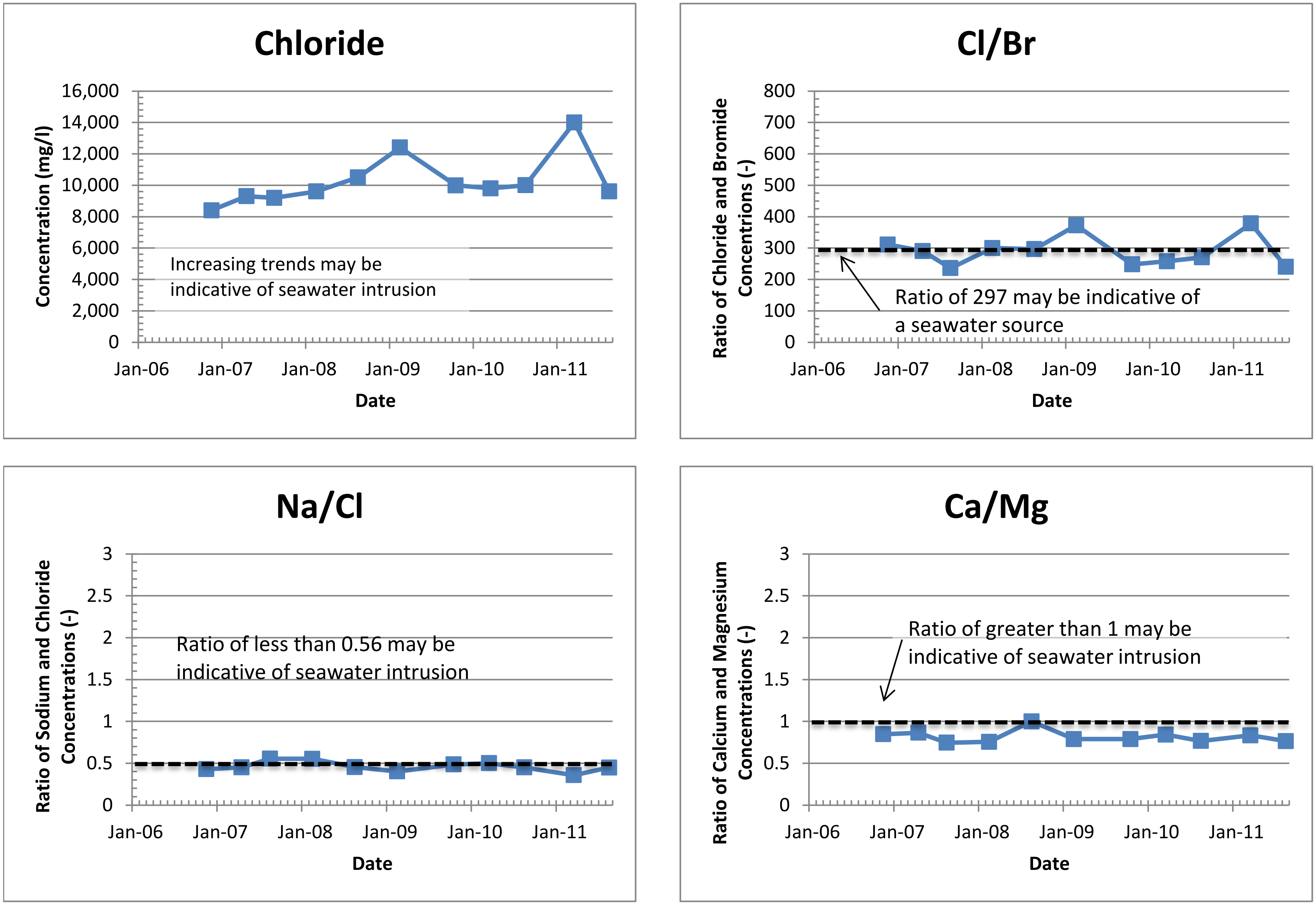




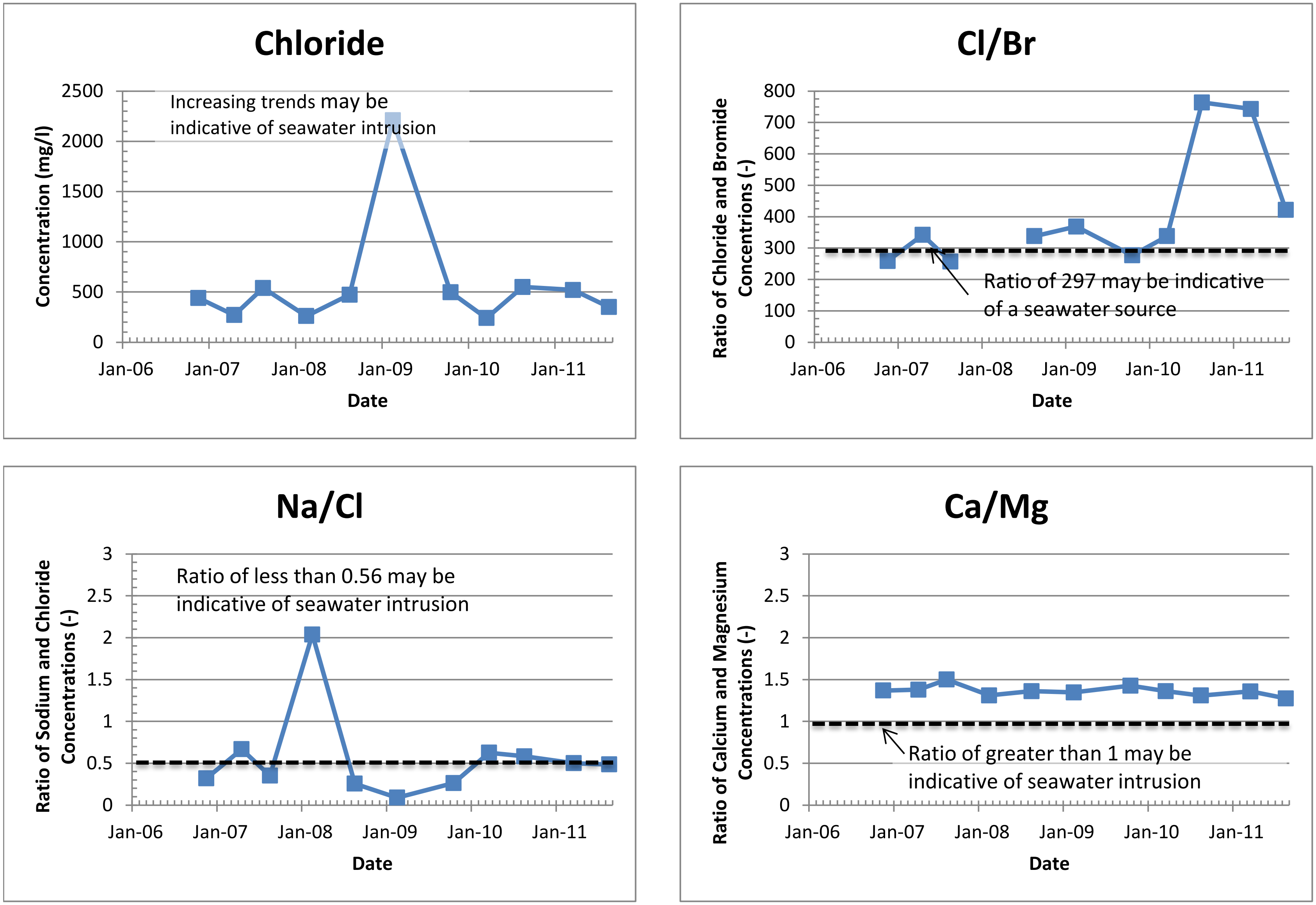




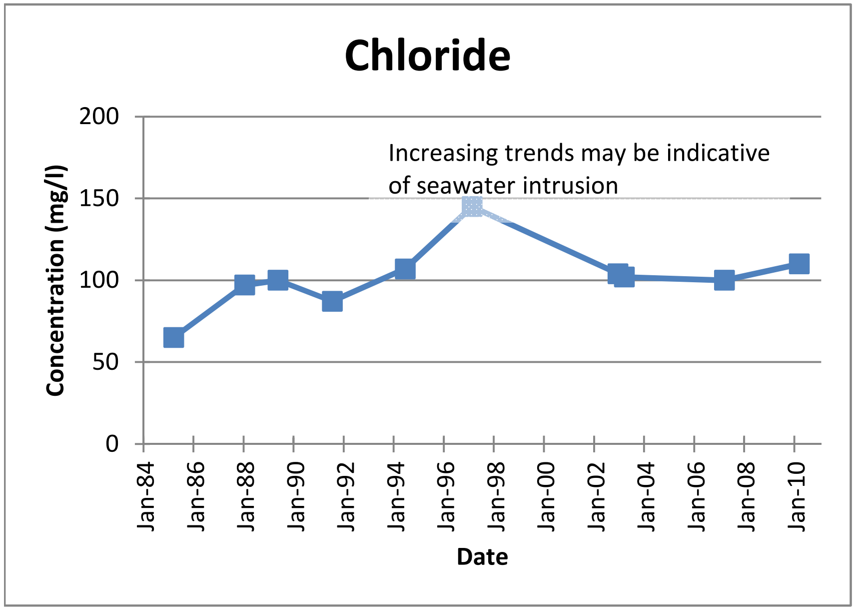
Seawater Intrusion Indicators for Well SFO-S

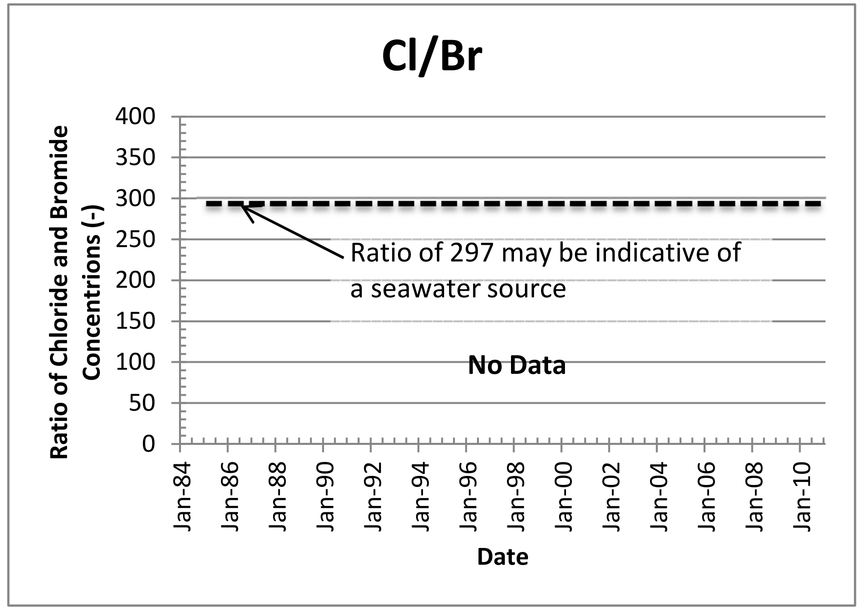


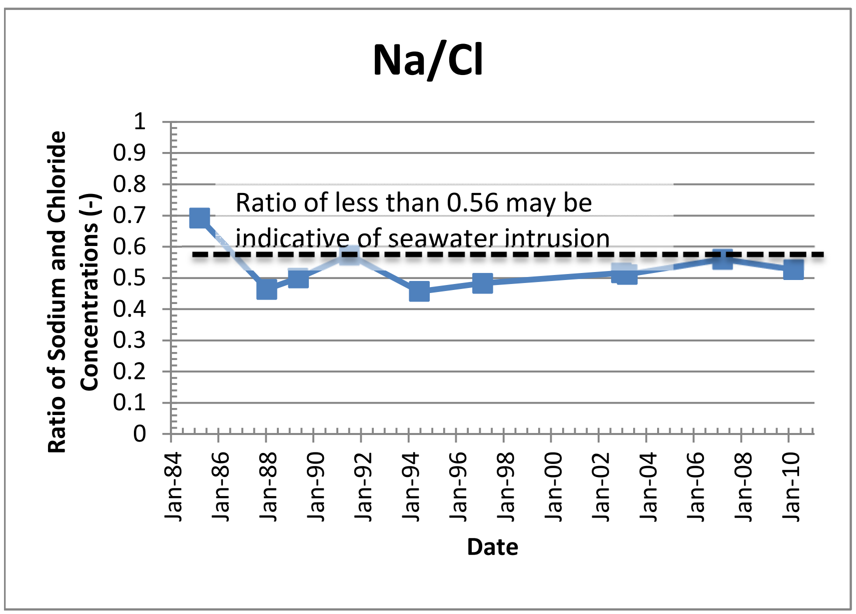
Seawater Intrusion Indicators for Well SFO-D

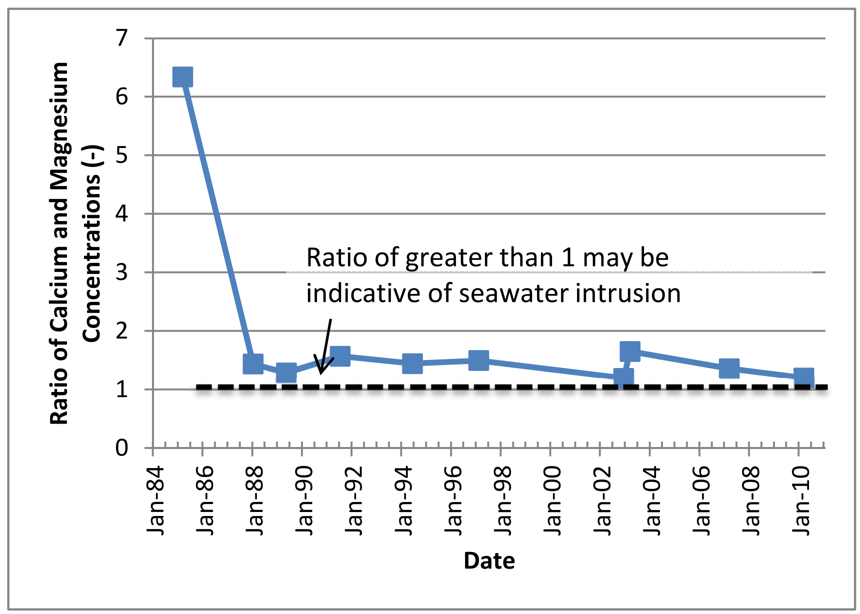


Seawater Intrusion Indicators for Well SB-15

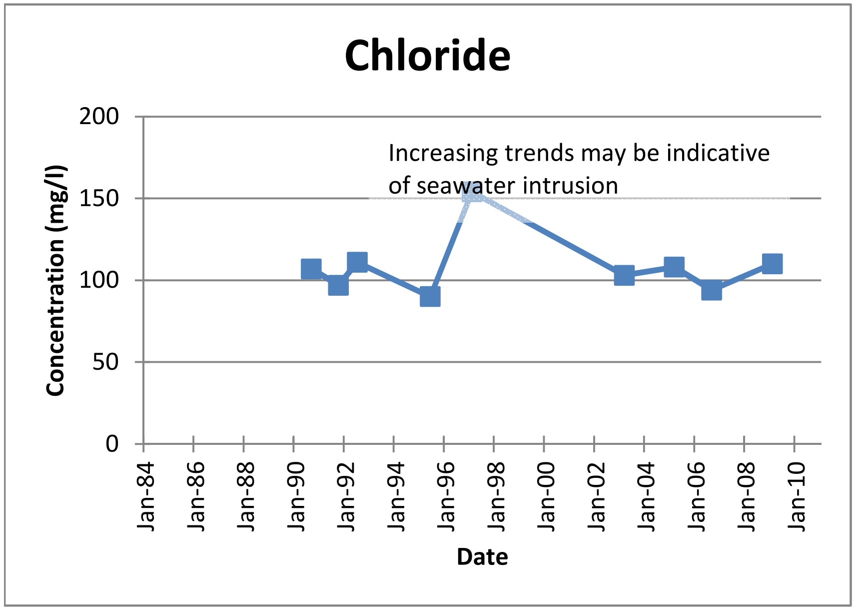


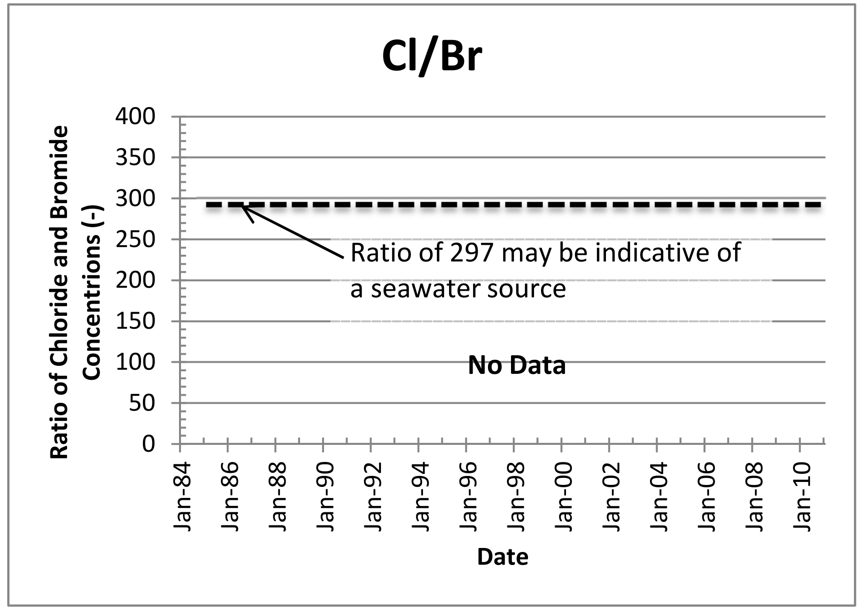


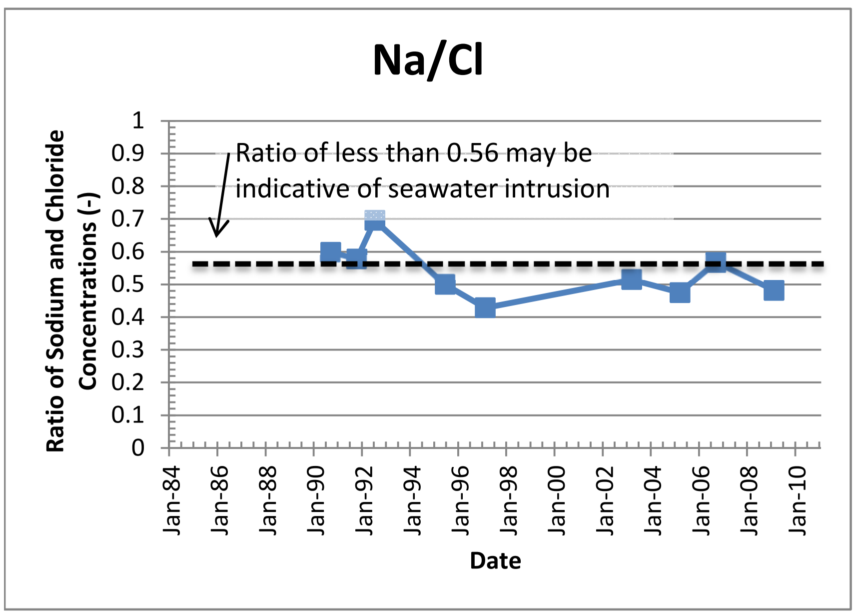


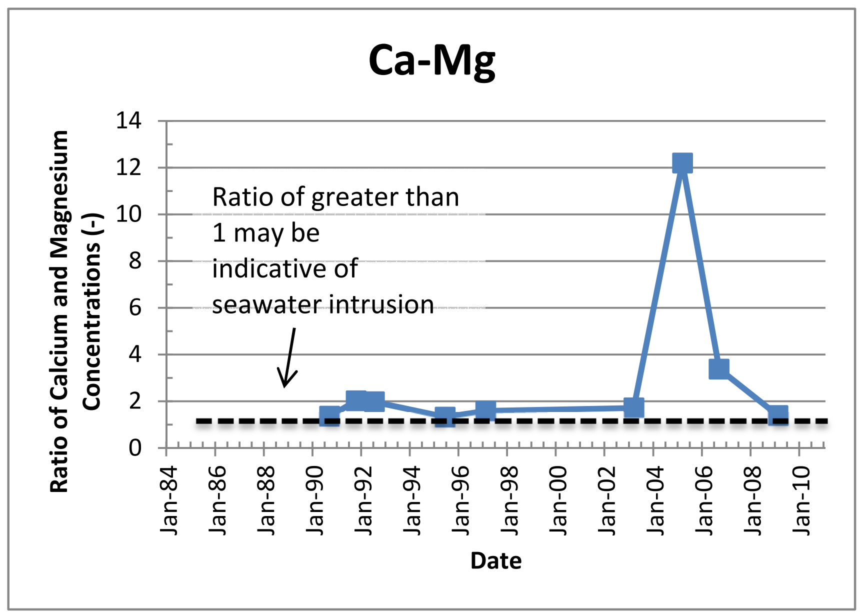


Seawater Intrusion Indicators for Well SB-16

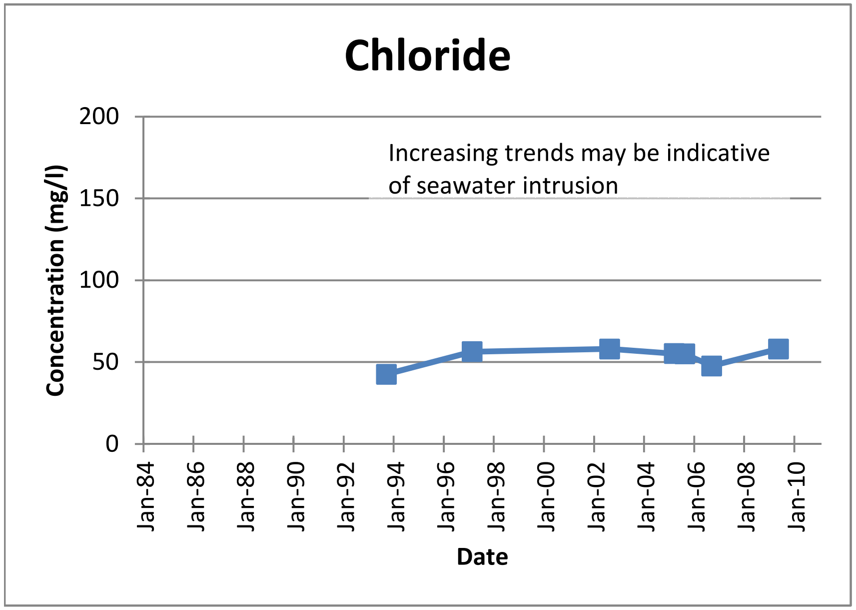


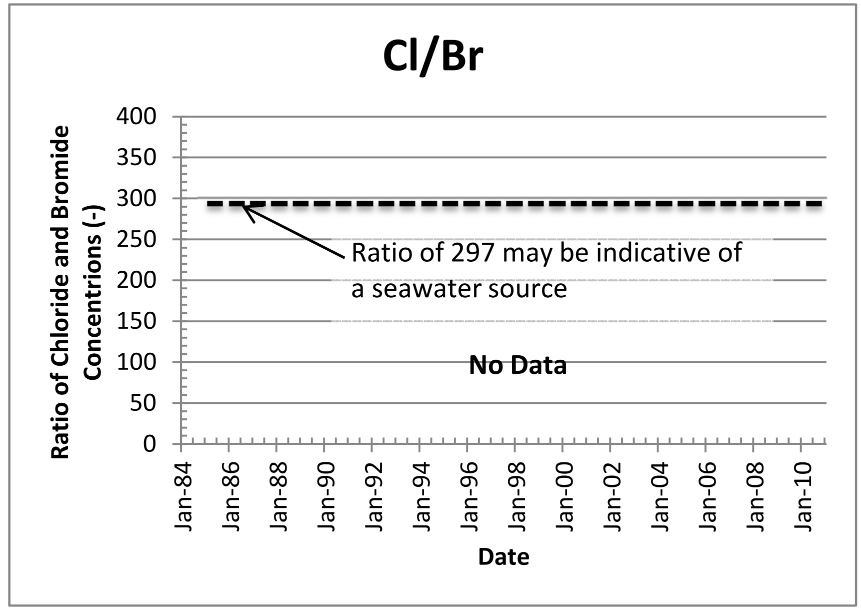


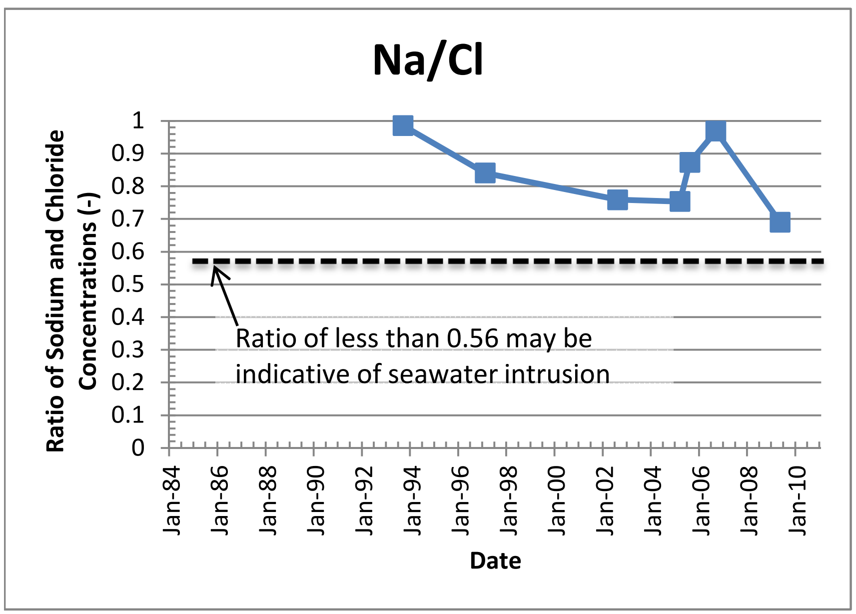


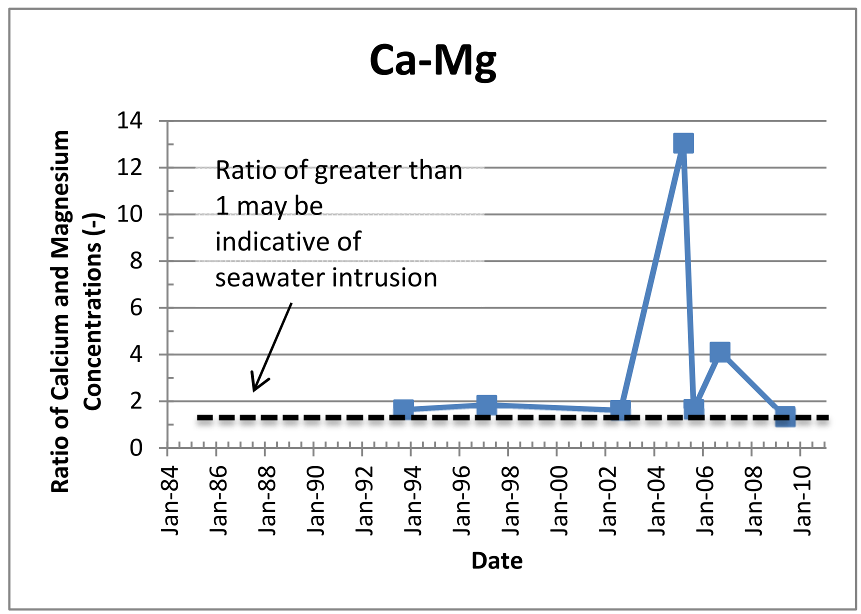


Seawater Intrusion Indicators for Well SB-17

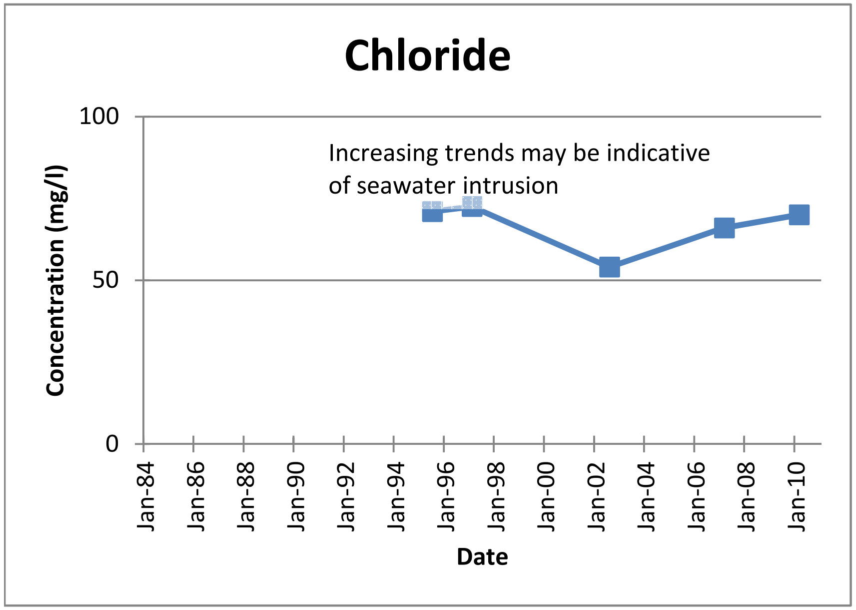


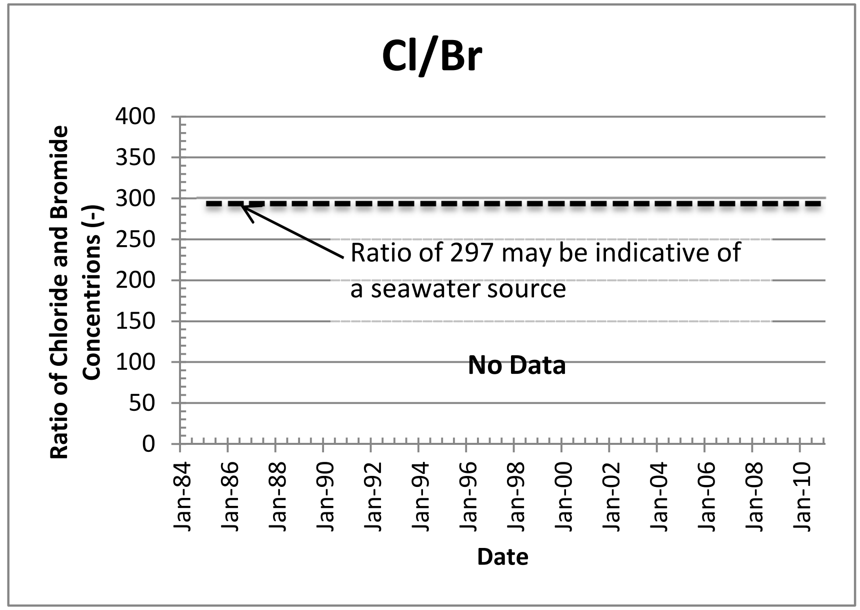


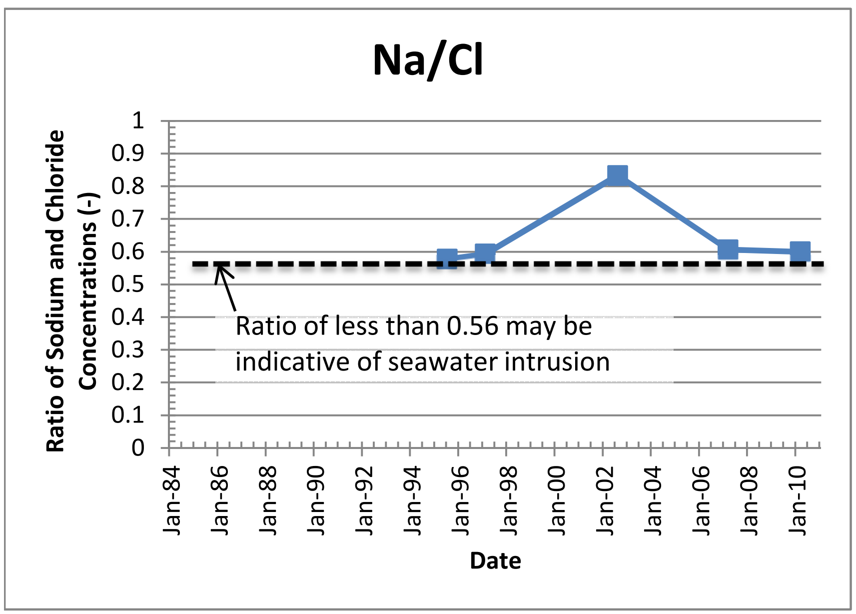


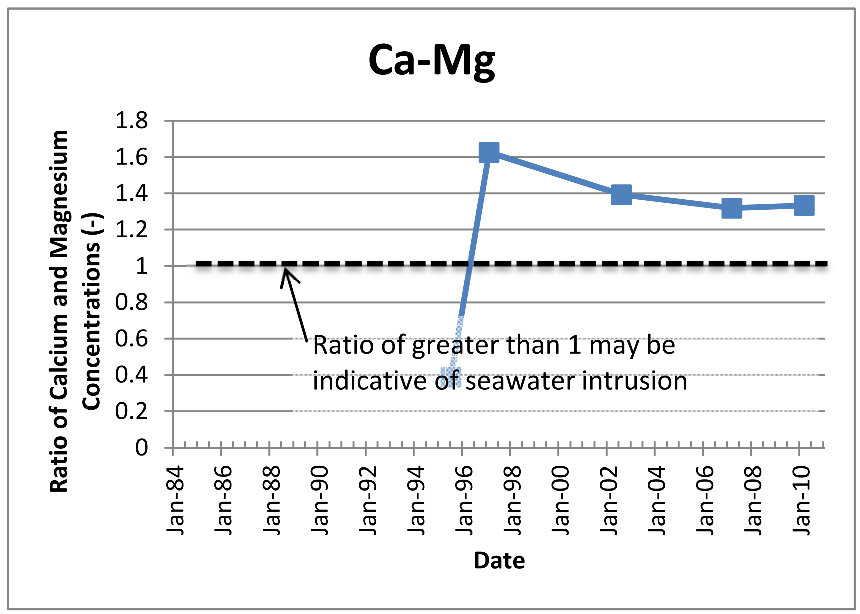


Seawater Intrusion Indicators for Well SB-18

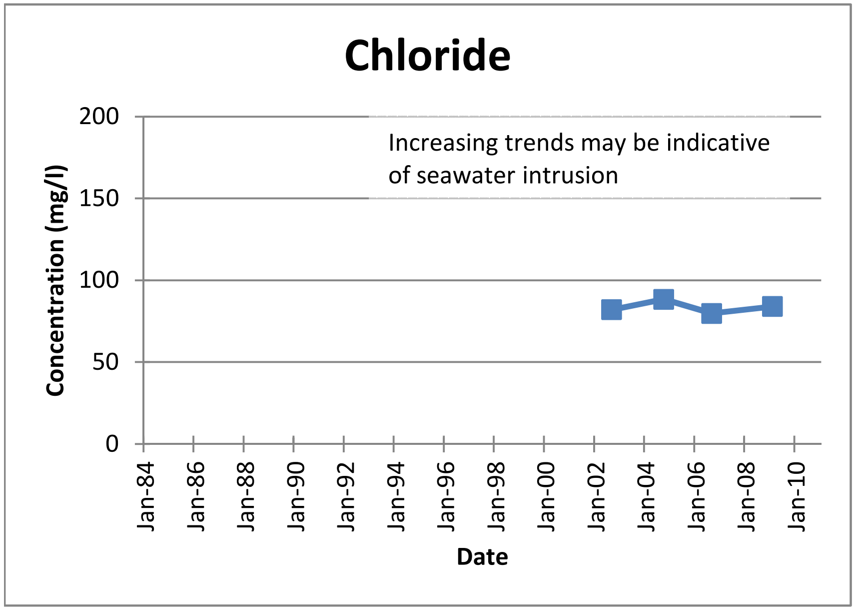


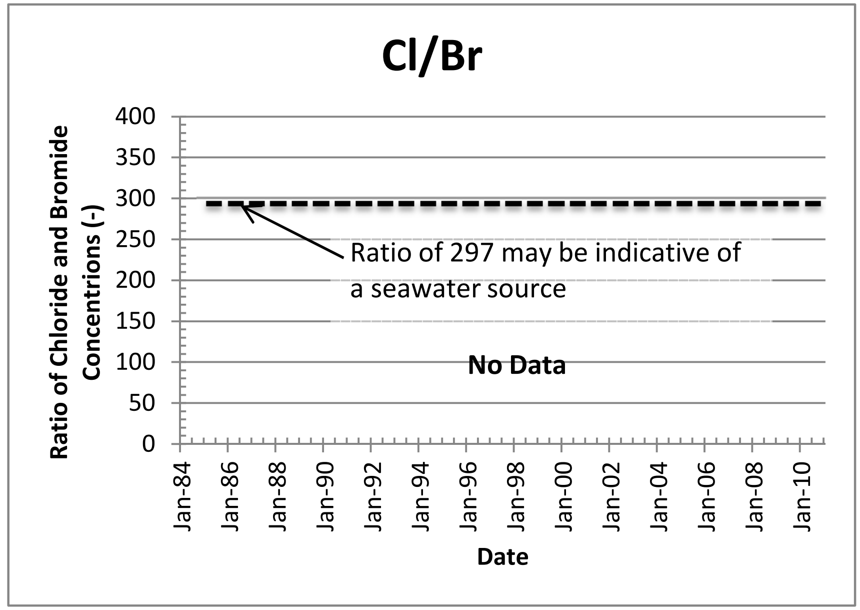


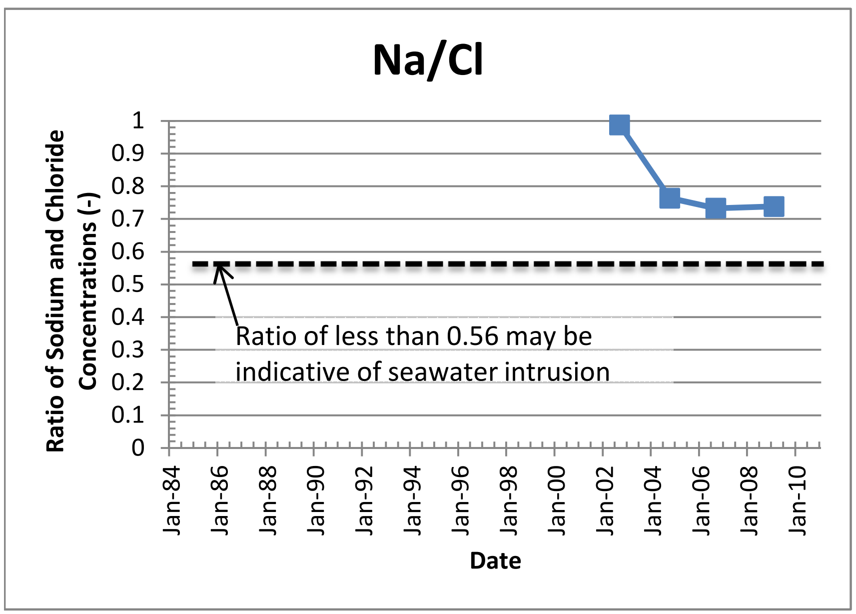


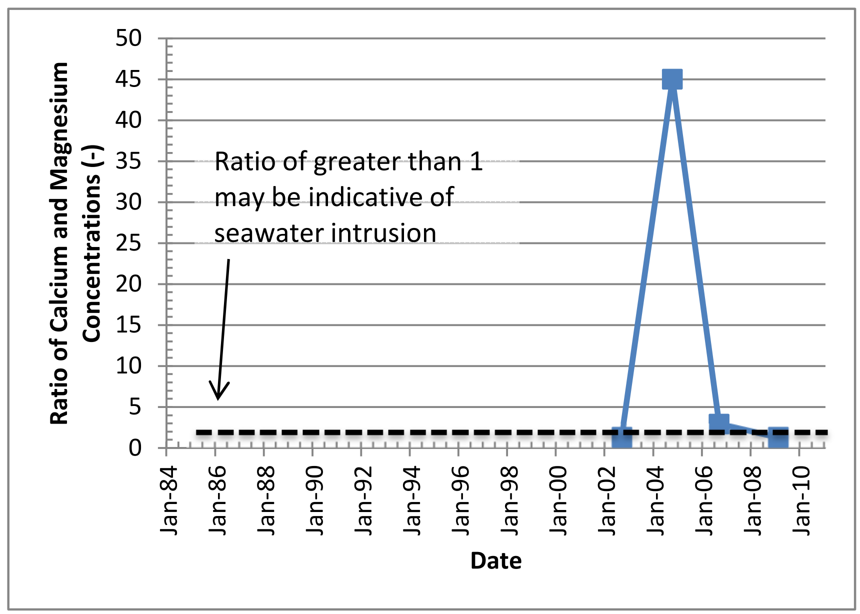


Seawater Intrusion Indicators for Well SB-20

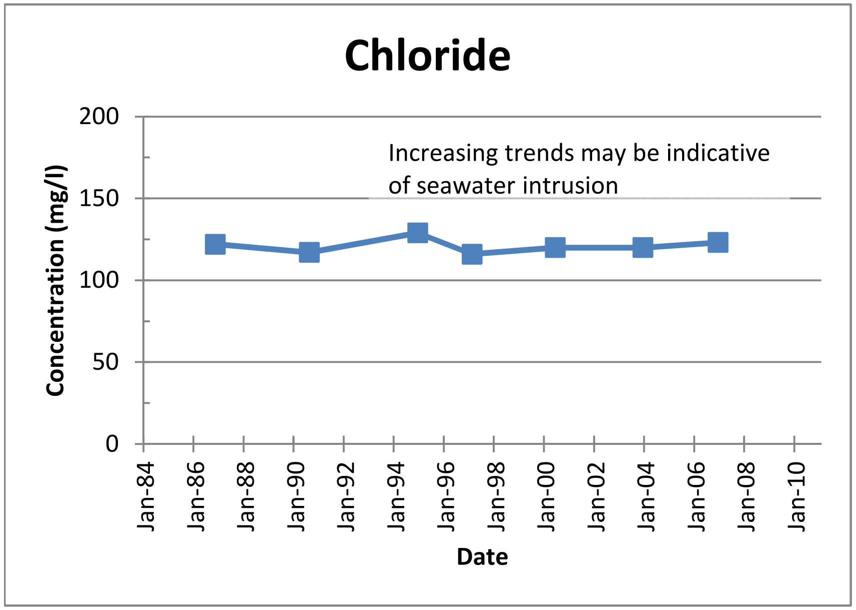


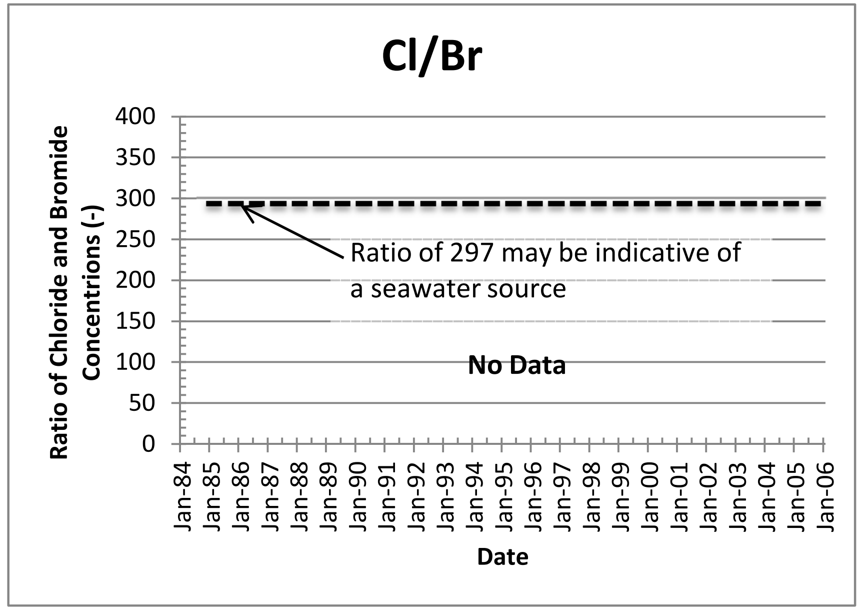


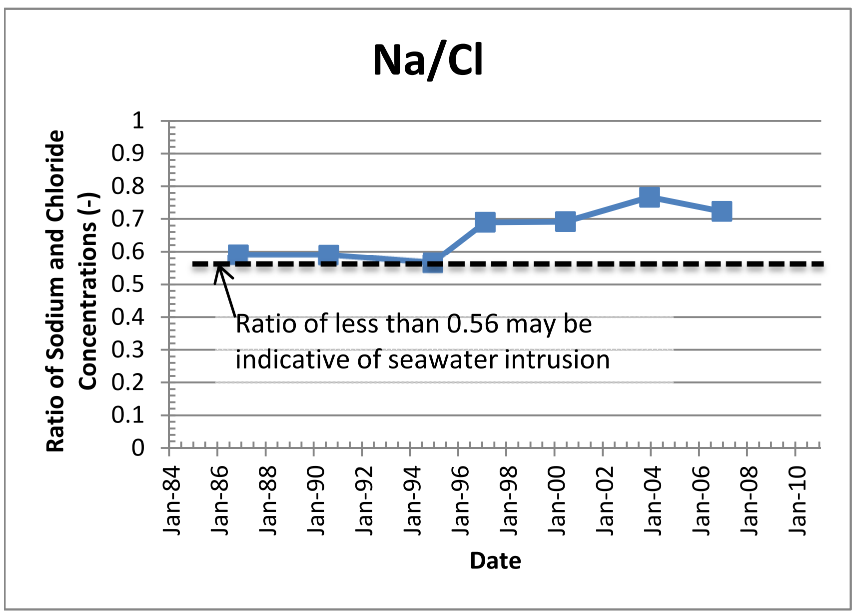


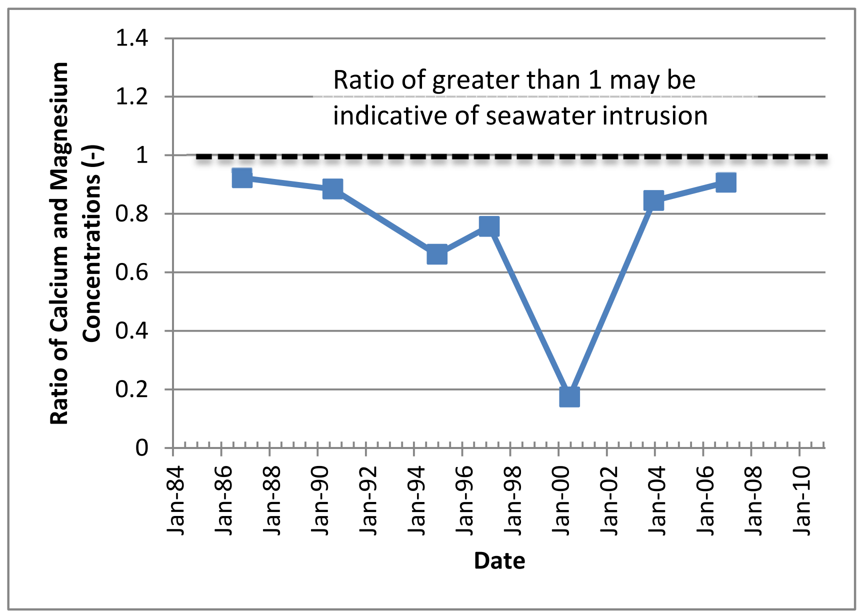


Seawater Intrusion Indicators for Well 01-14

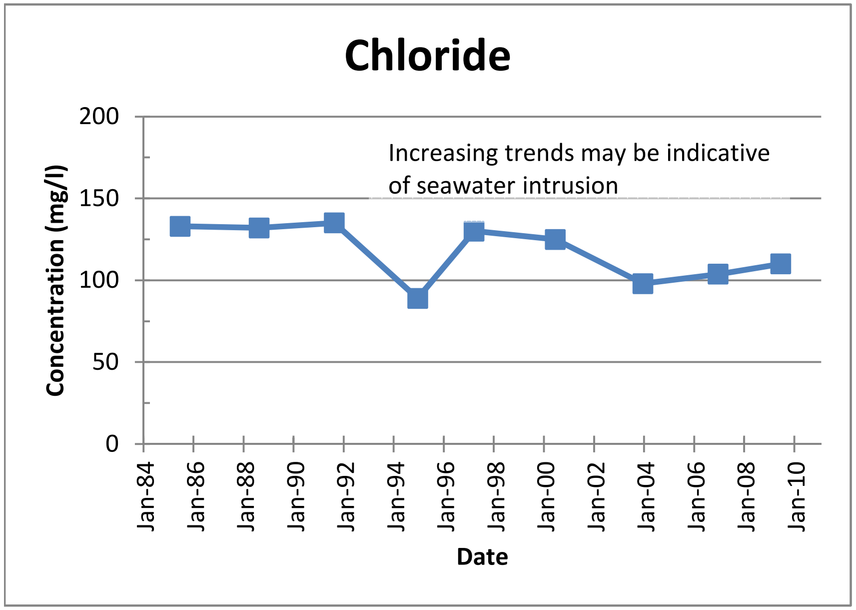


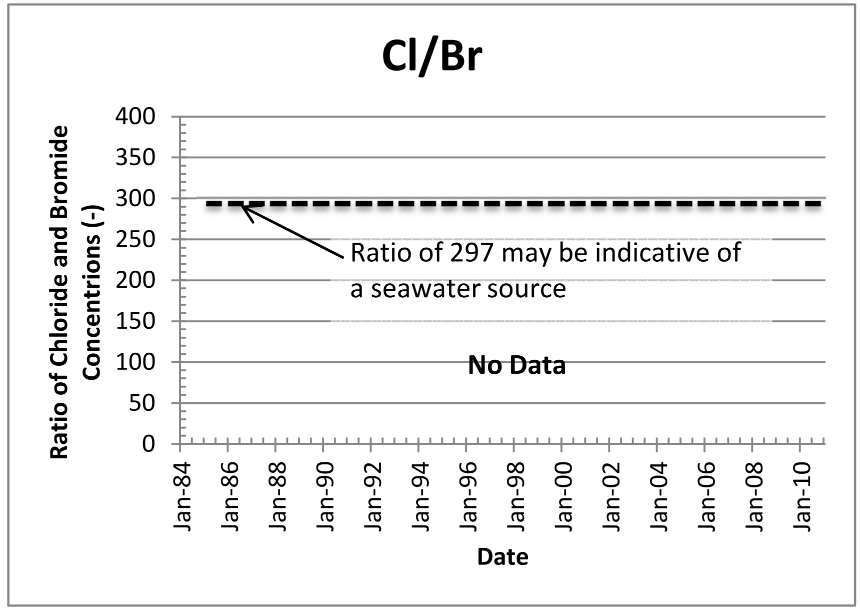


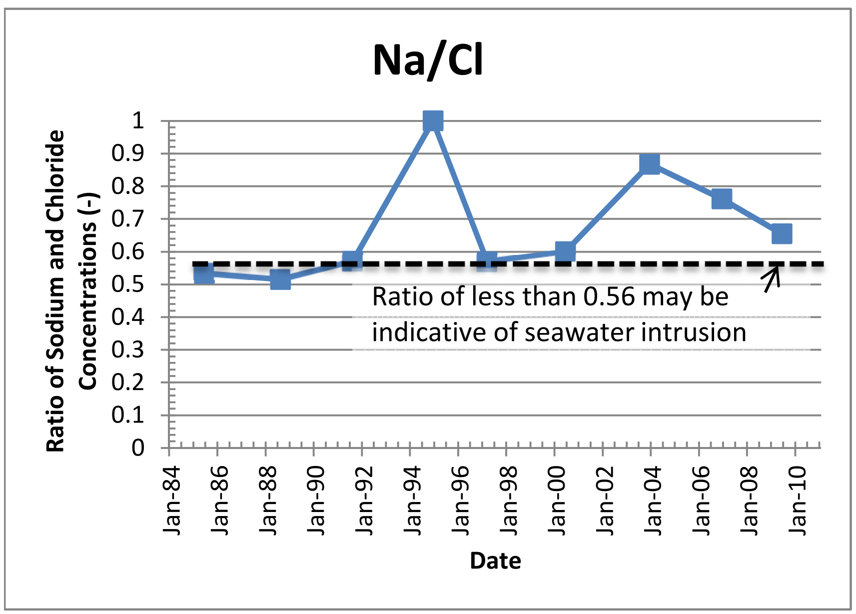


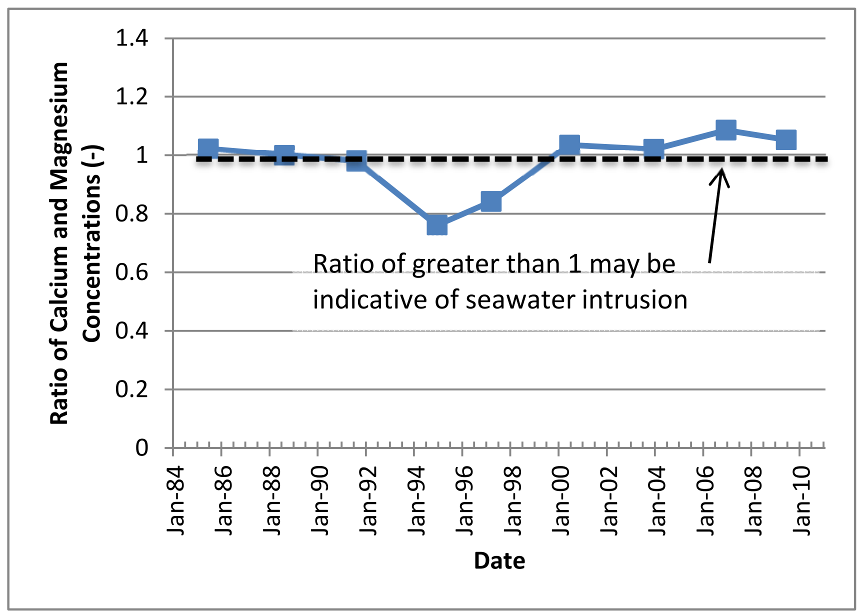


Seawater Intrusion Indicators for Well 01-15

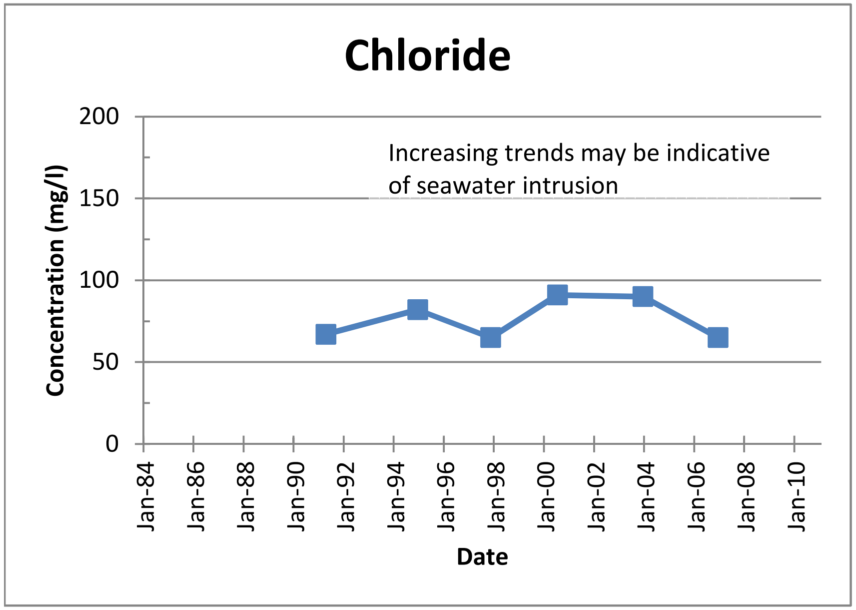


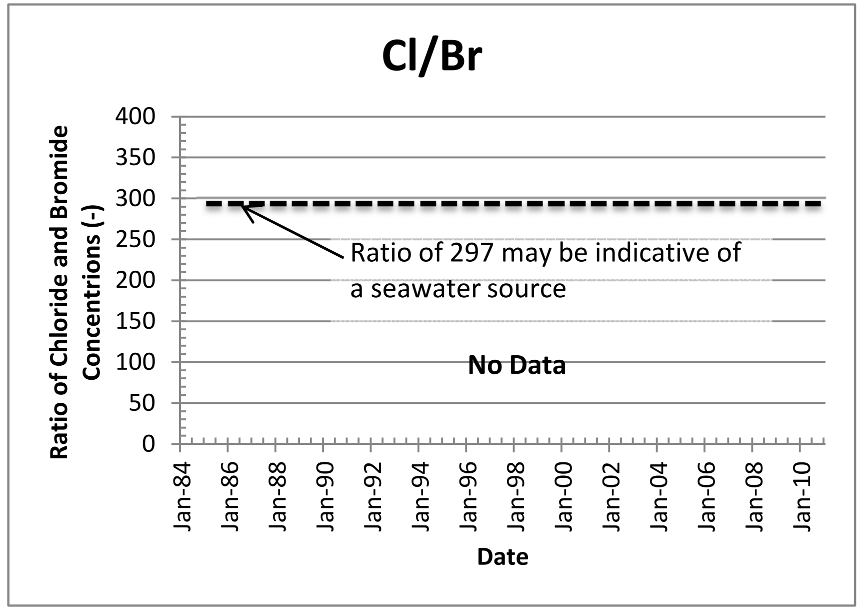


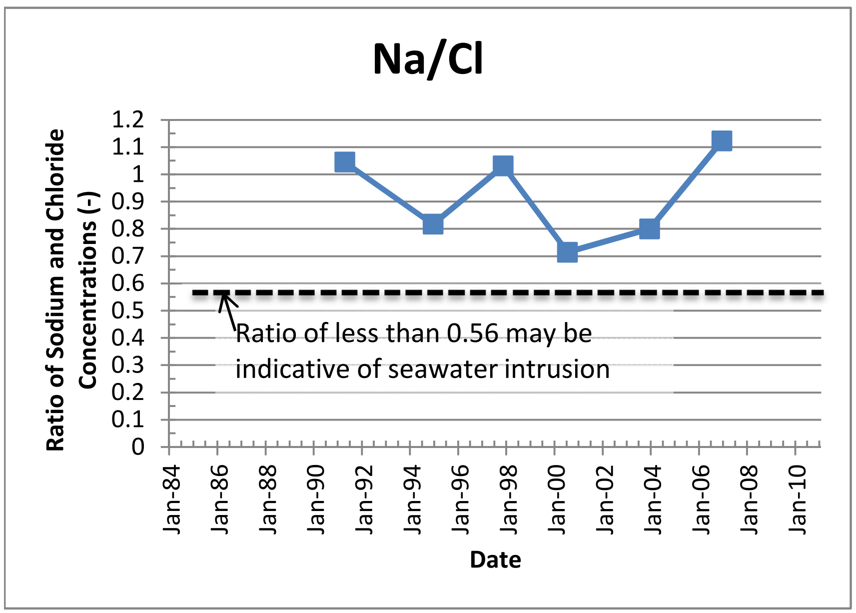


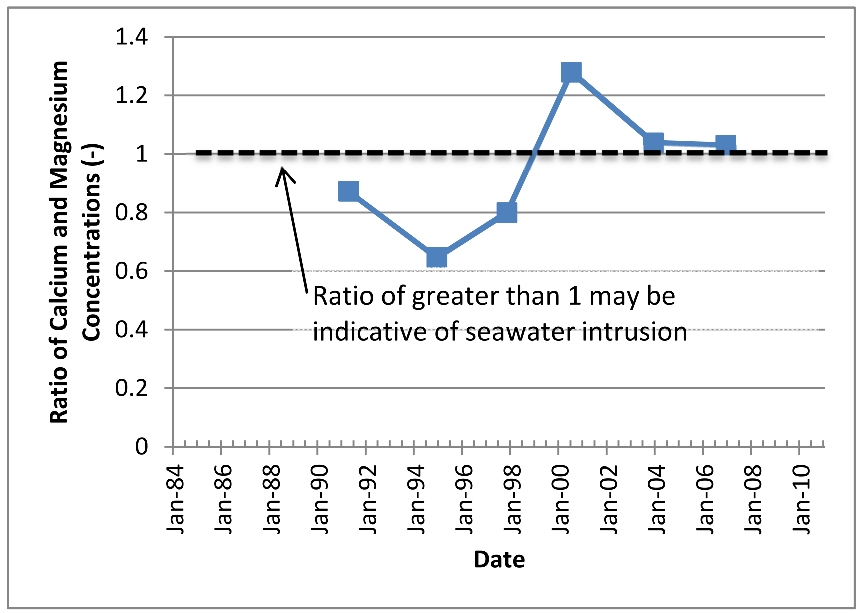


Seawater Intrusion Indicators for Well 01-18

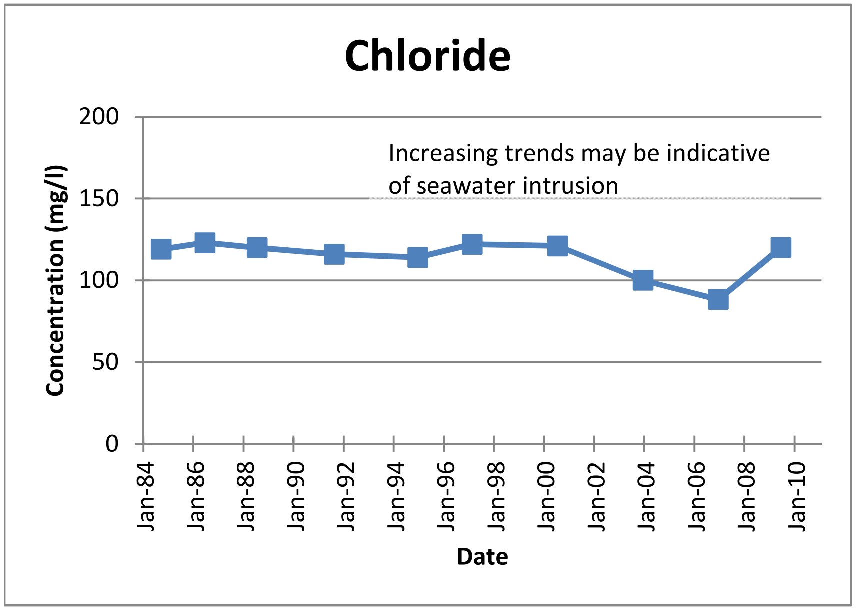


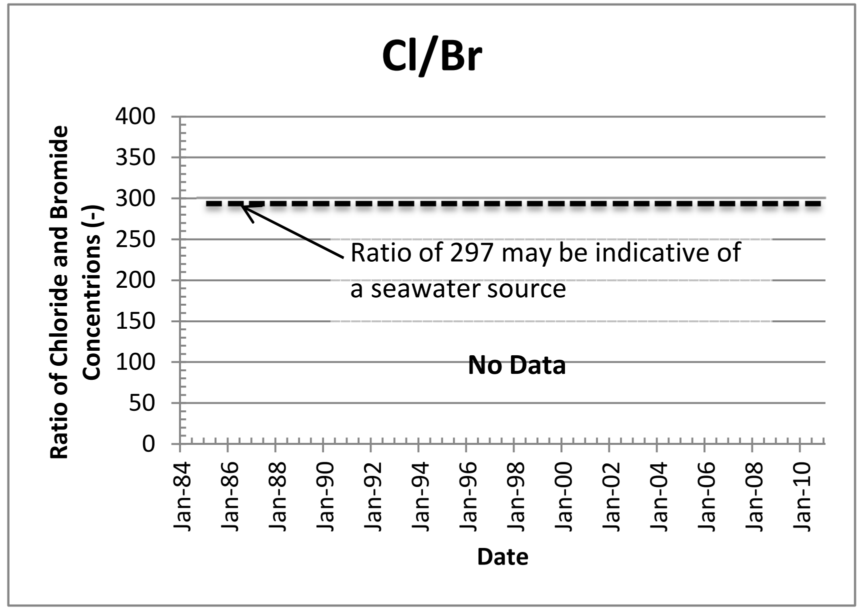


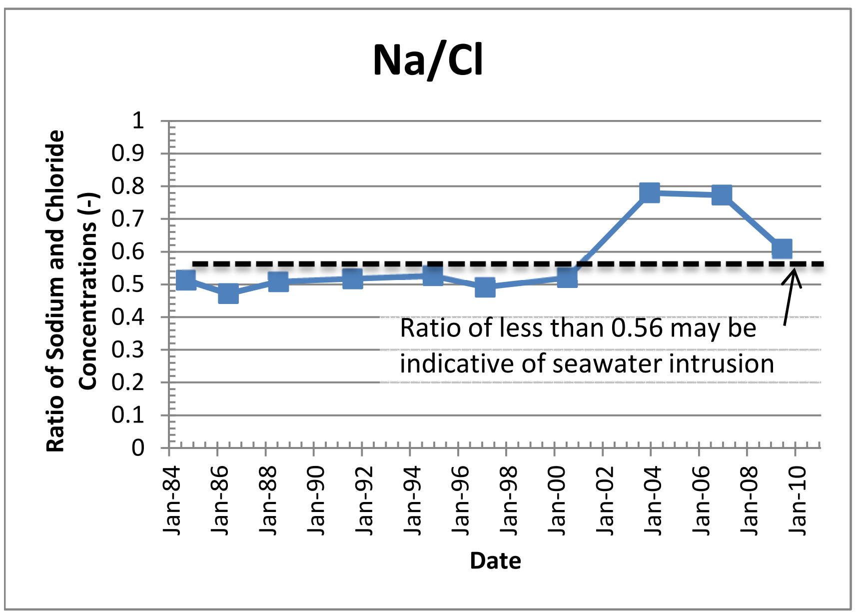


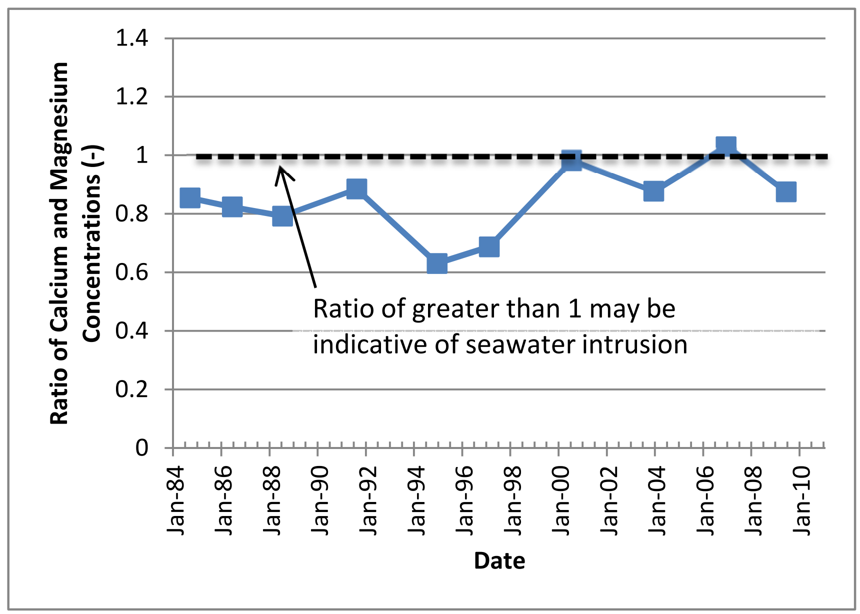


Seawater Intrusion Indicators for Well 01-19

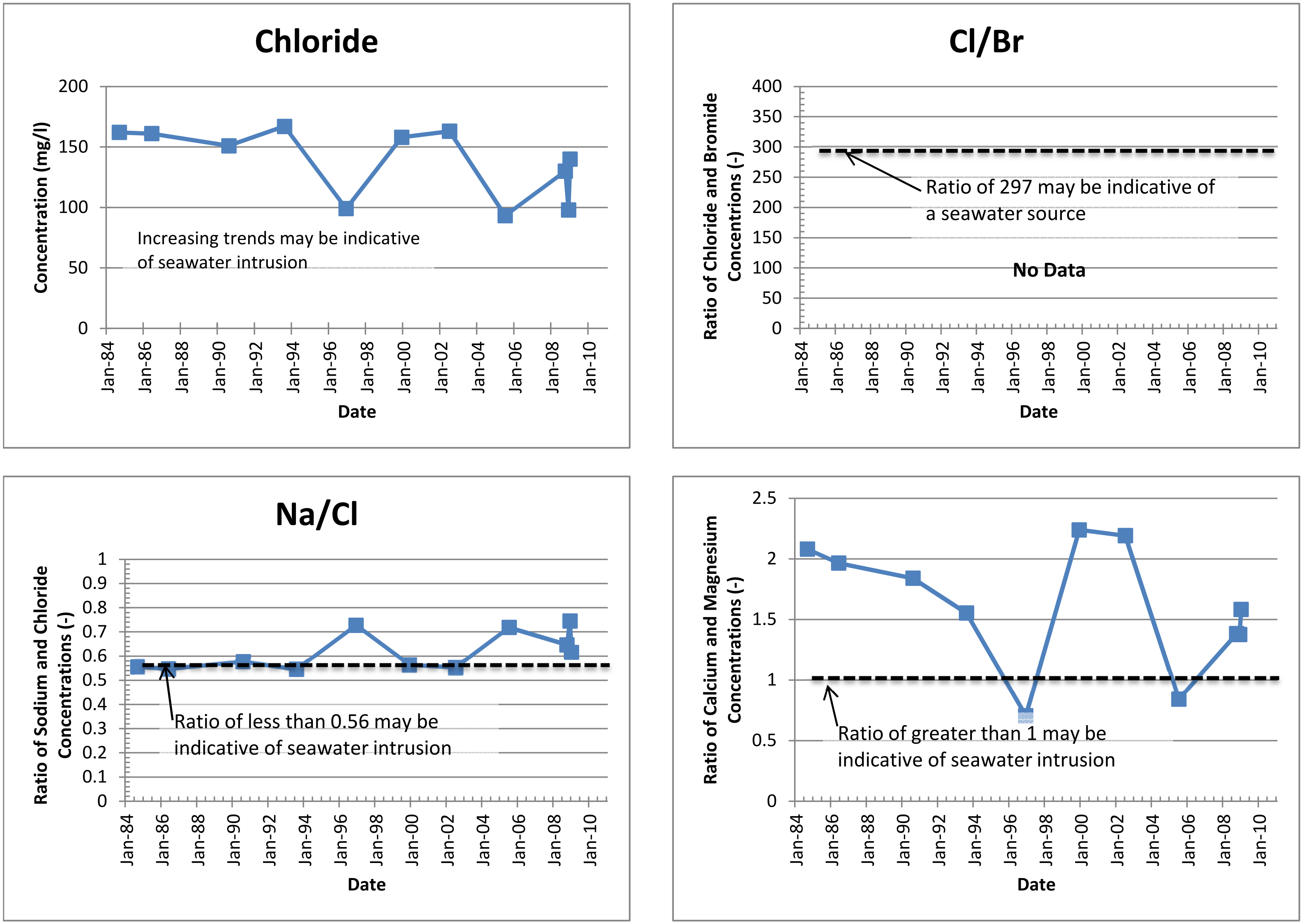




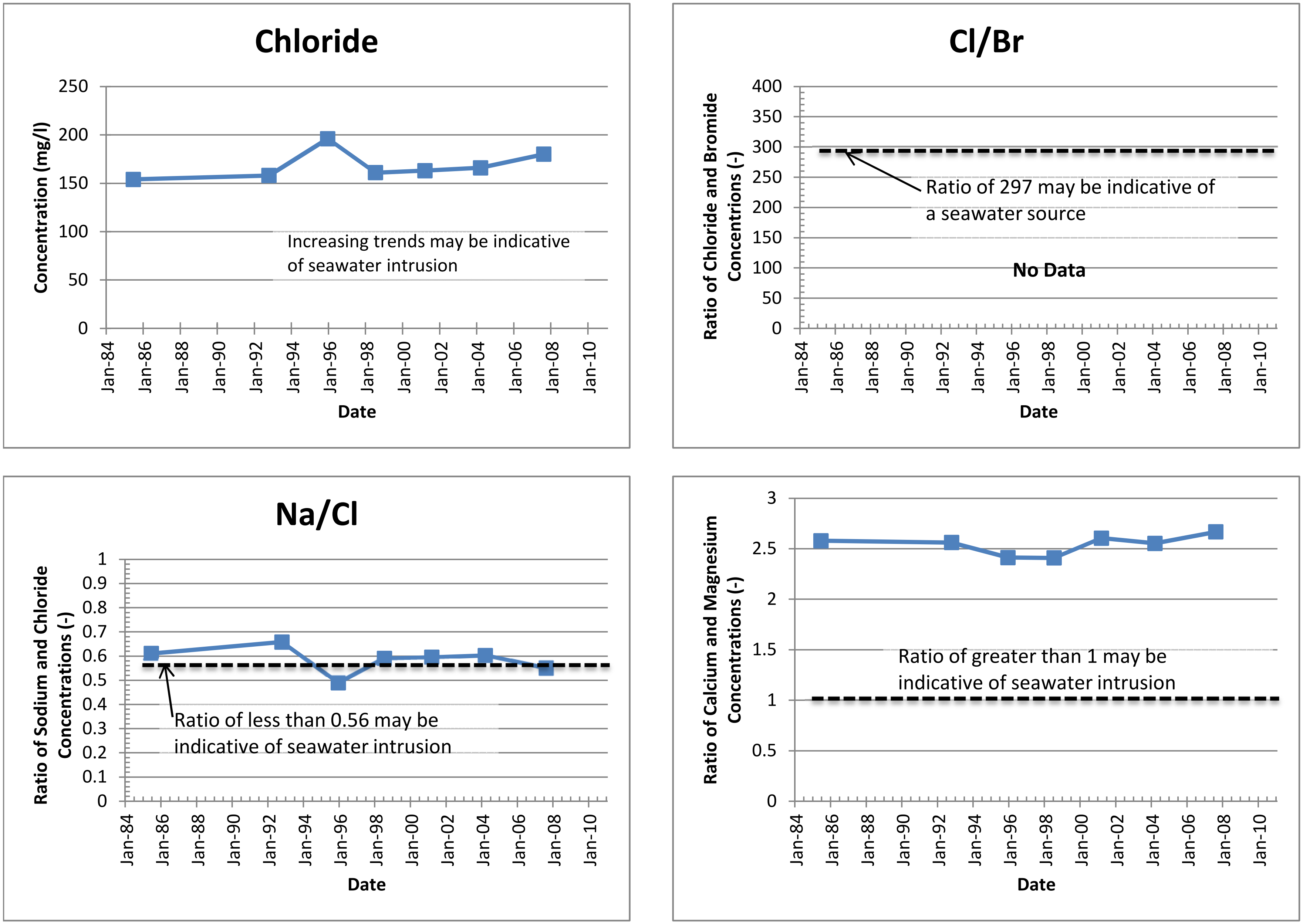




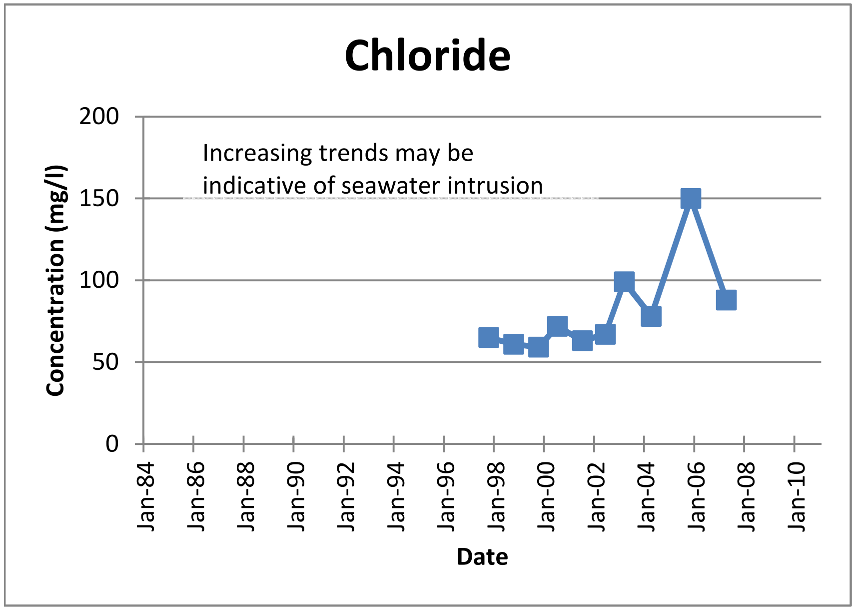
Seawater Intrusion Indicators for Well 01-20

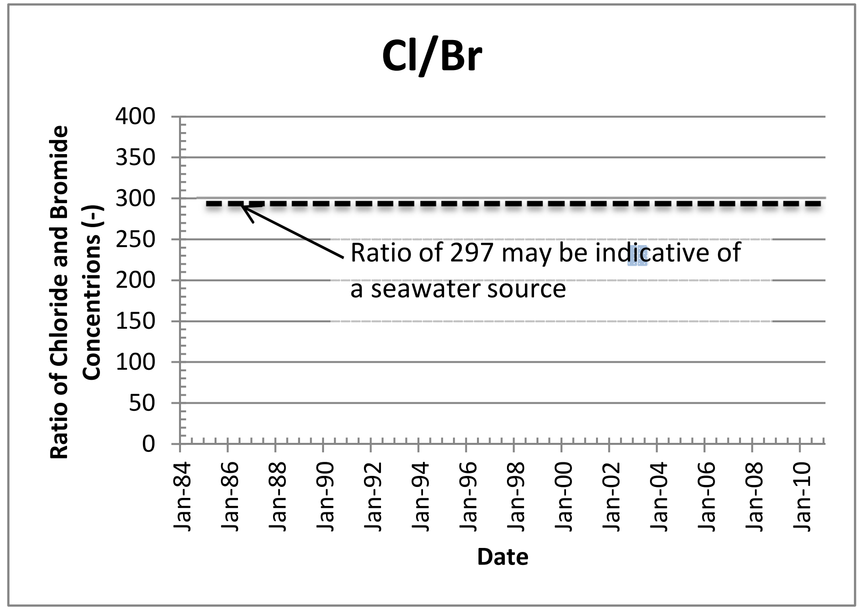


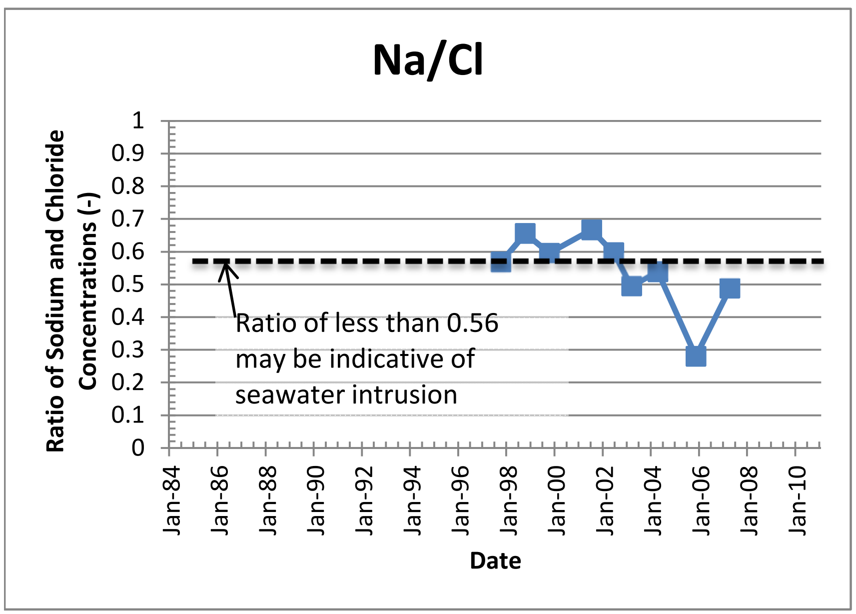
Seawater Intrusion Indicators for Well 01-21

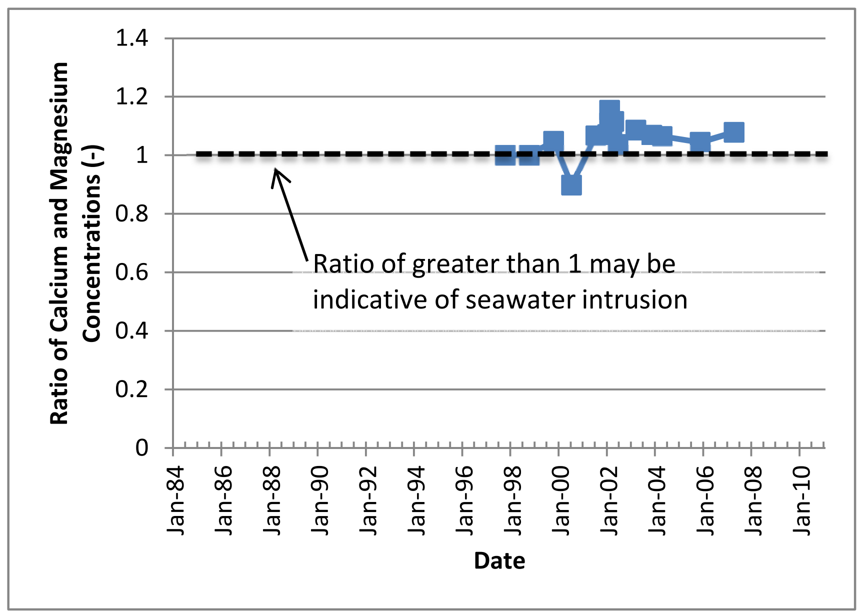


Seawater Intrusion Indicators for Well A Street

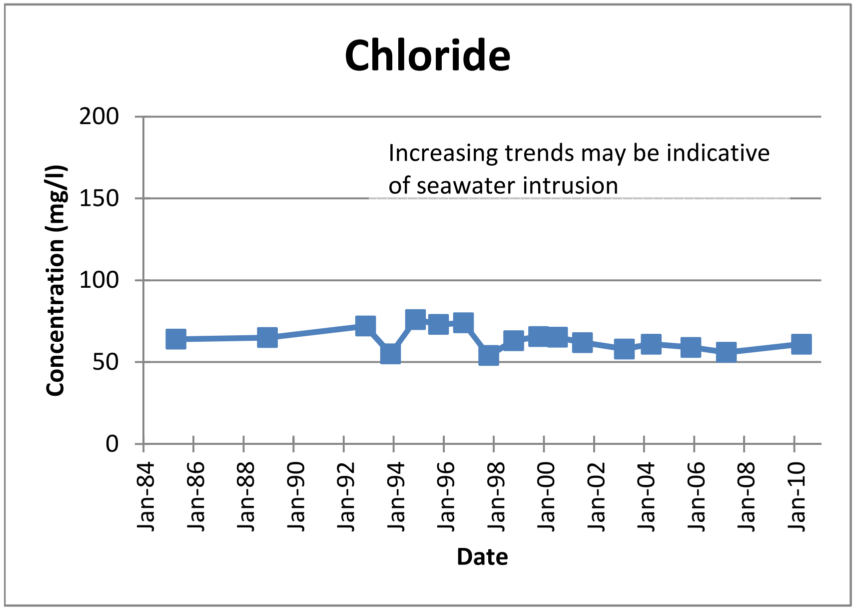


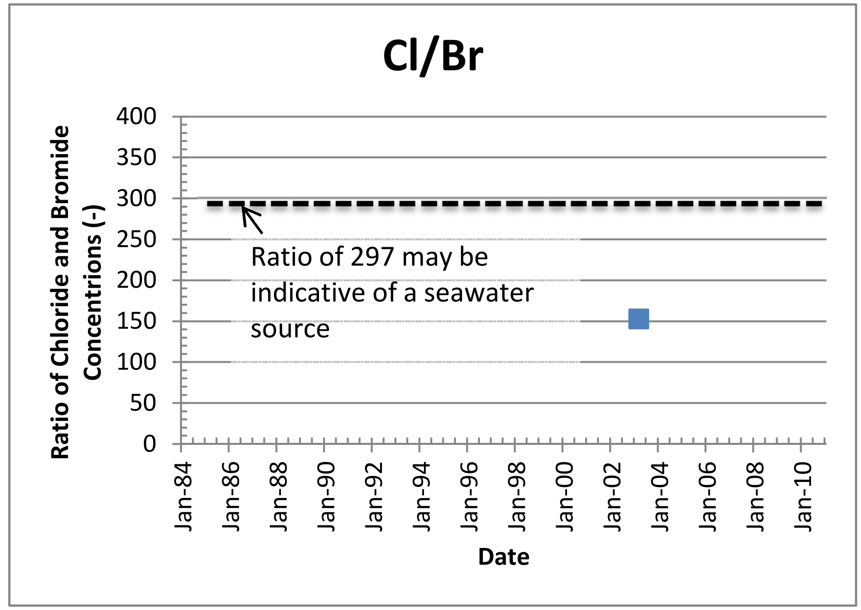


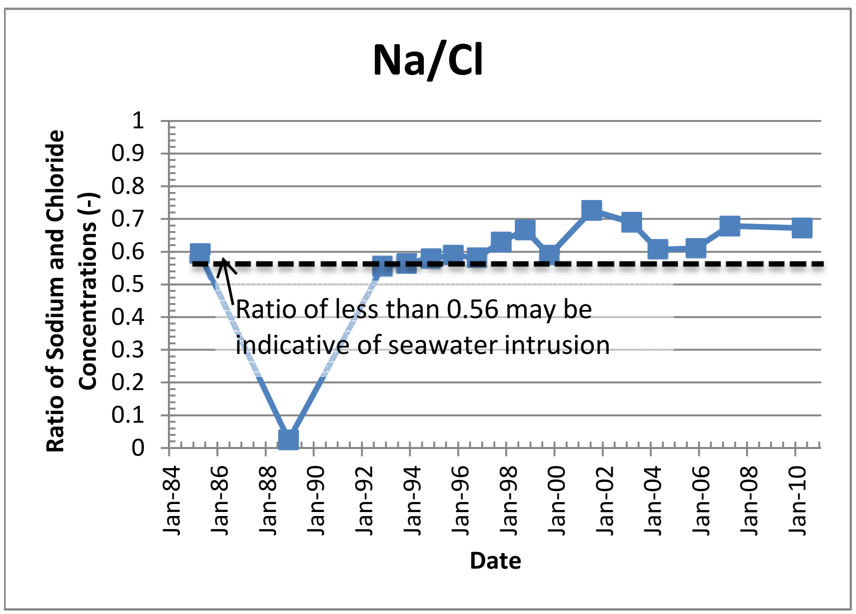


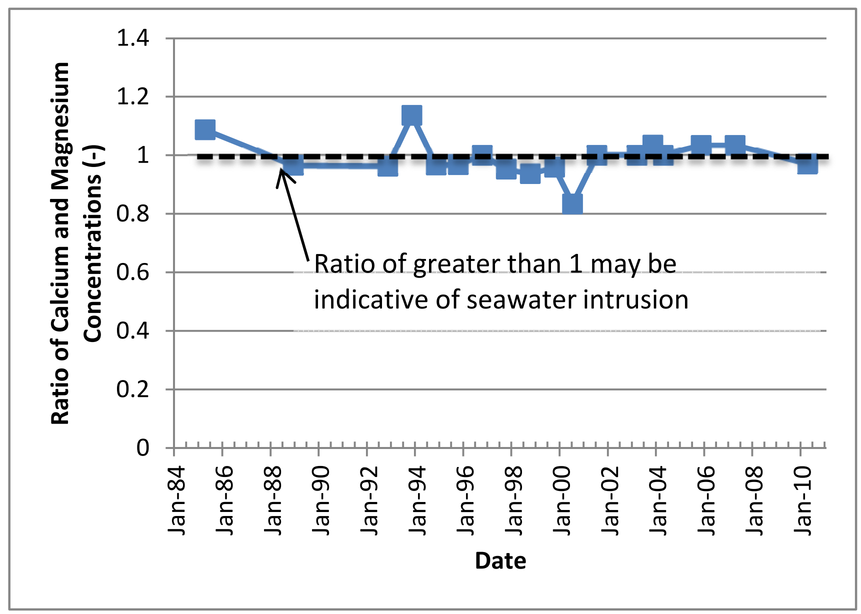


Seawater Intrusion Indicators for Well 4 Citrus

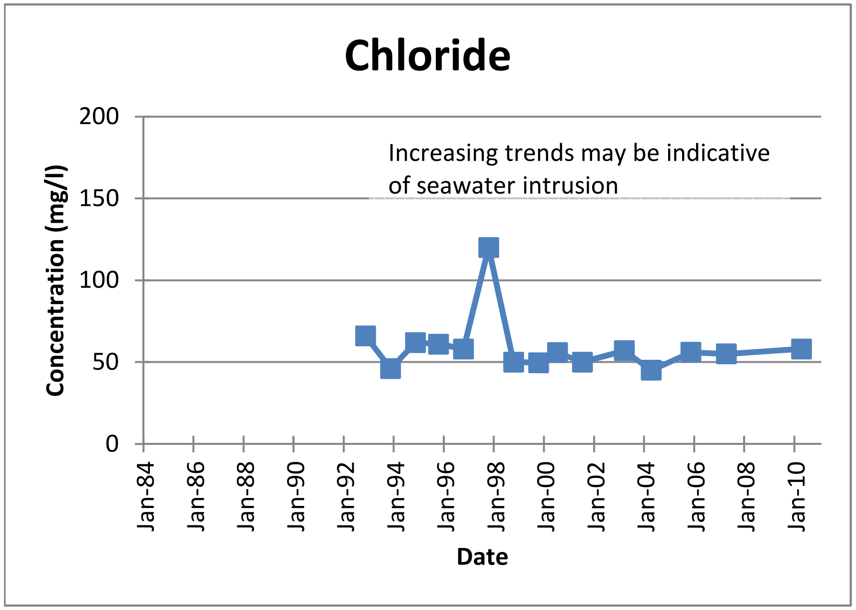


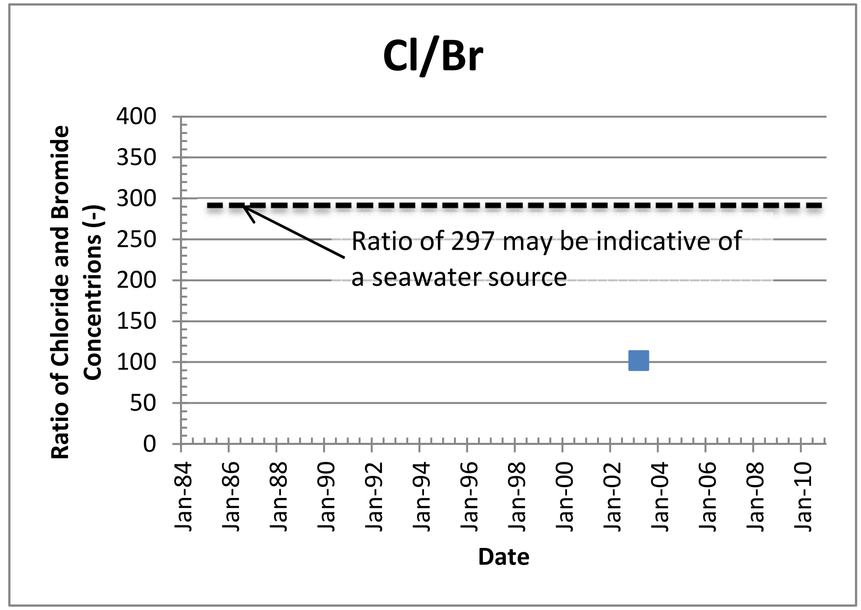


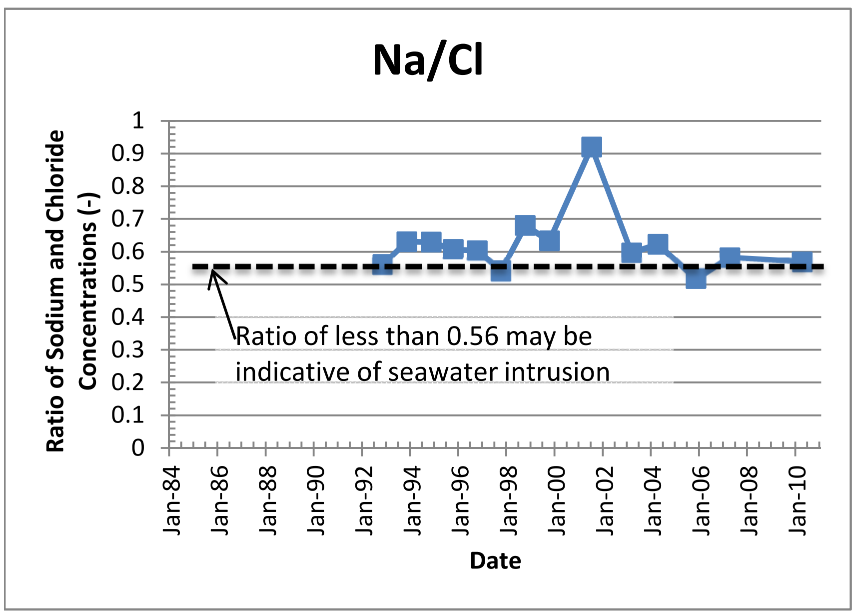


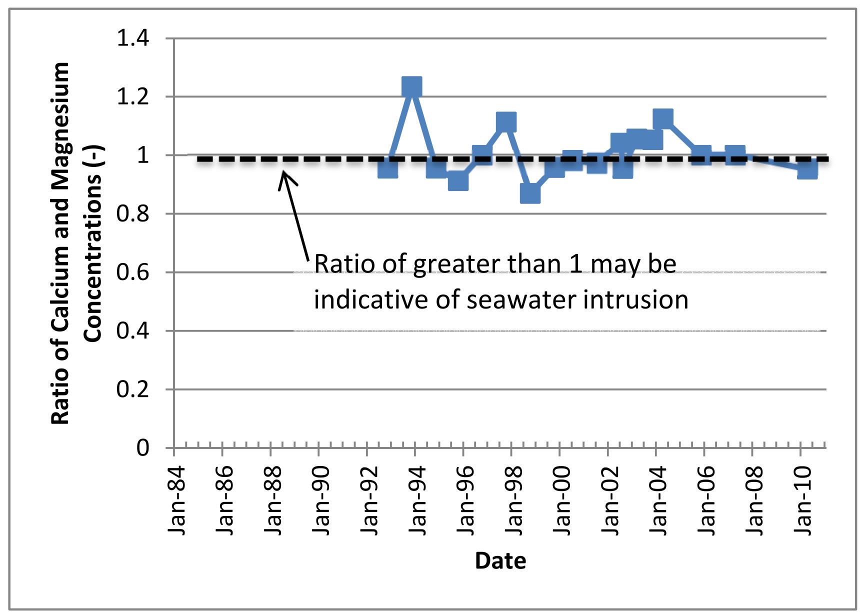


Seawater Intrusion Indicators for Well Jefferson

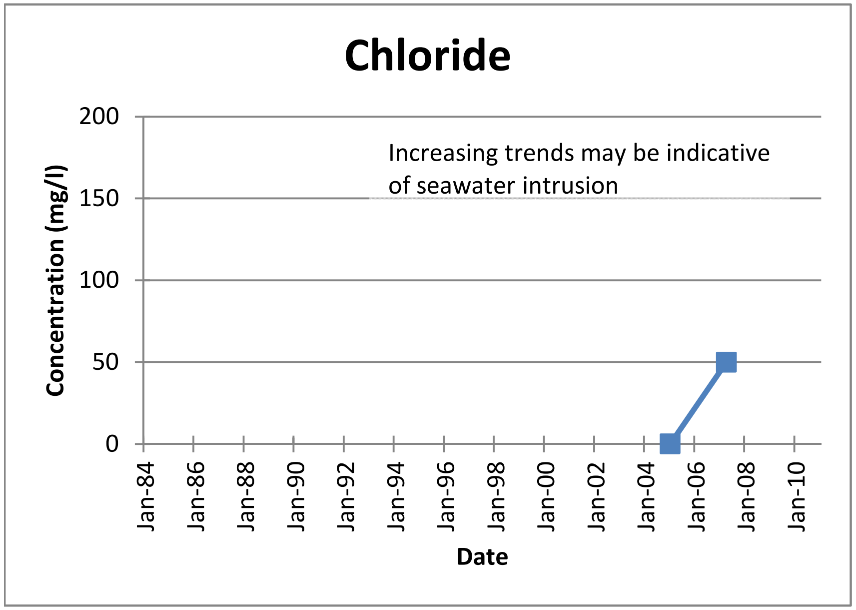


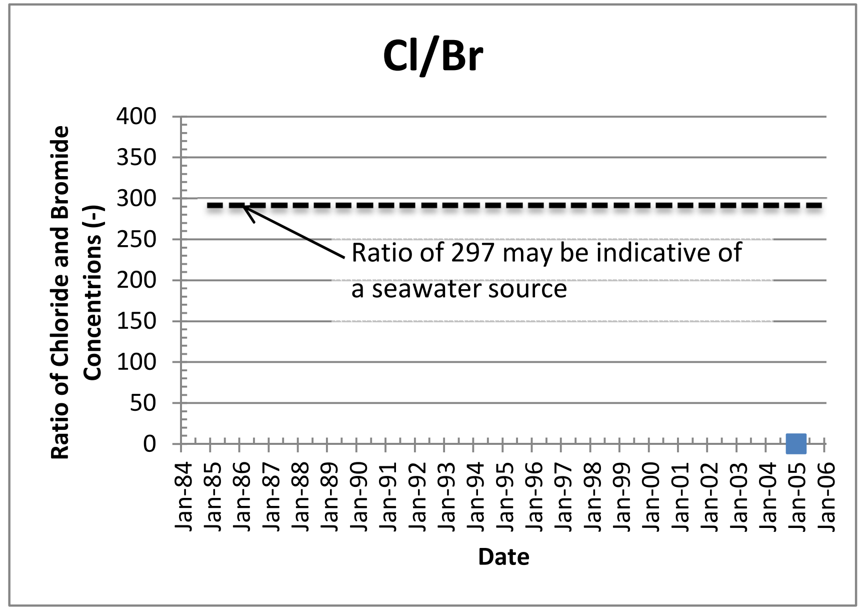


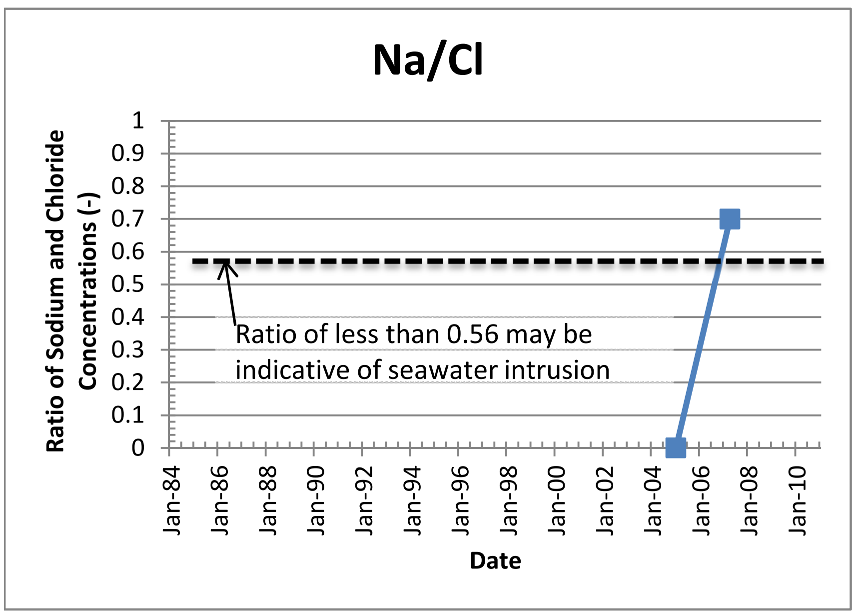


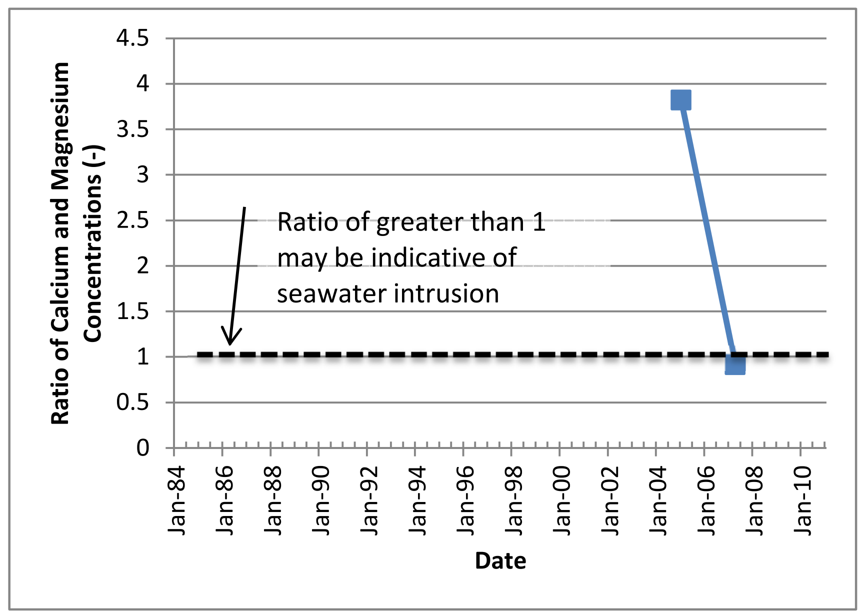


Seawater Intrusion Indicators for Well Junipero Serra

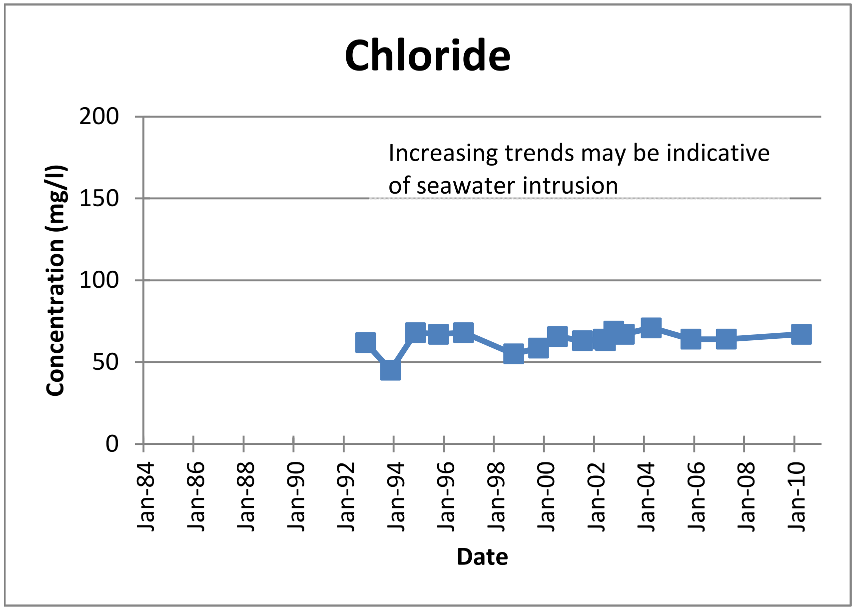


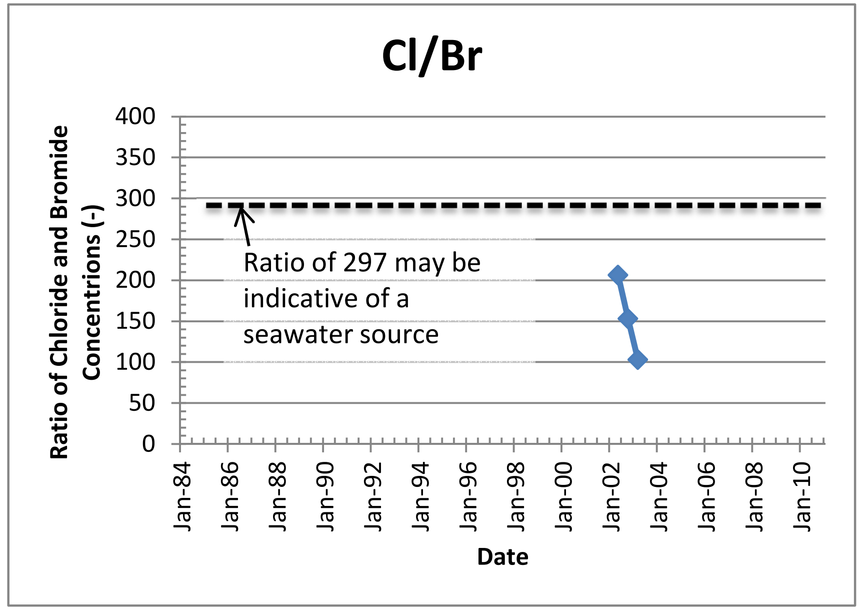


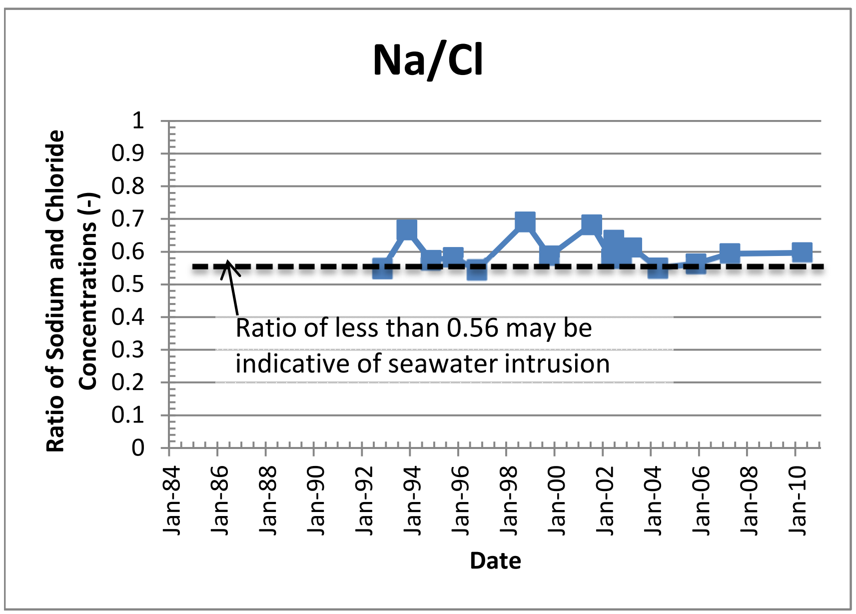


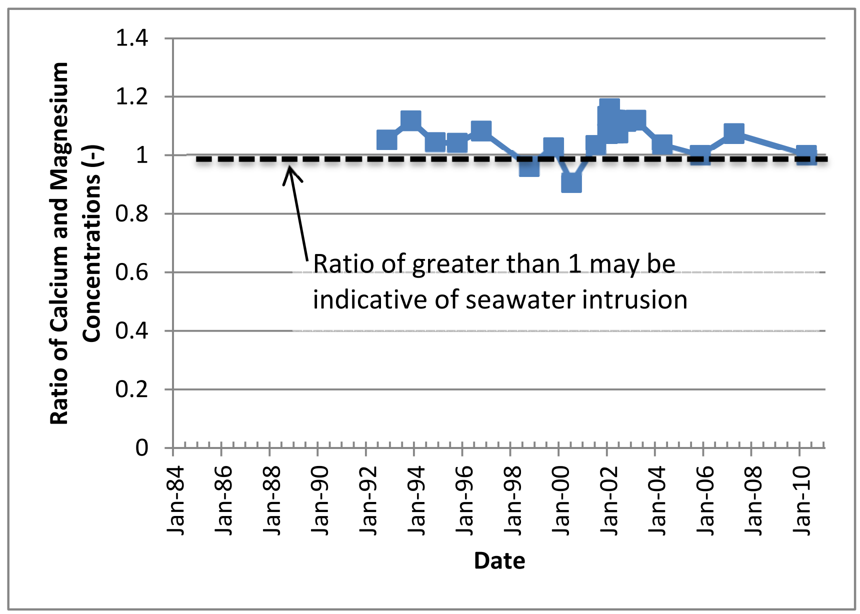


Seawater Intrusion Indicators for Well Vale









Seawater Intrusion Indicators for Well Westlake